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1826.

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of the Nat. Hist. Soc. of Berlin and of Copen-
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Hist. New York, and of the Royal Agricultural
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[1838.]

205

On the Vices of Horses.
F.L.S., etc. London. 1839.

By Bracy Clark,

6.2.



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161

A

SHORT HISTORY

OF THE

HORSE,

AND

PROGRESS OF HORSE KNOWLEDGE.

BY BRACY CLARK, F.L.S.

FOREIGN MEMBER OF THE ACADEMY OF SCIENCES OF PARIS; OF THE NATURFORSCHENDER FREUNDE
OF BERLIN, &c.

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AND W. CHAPPLE, Pall Mall.

1824.

SHORT HISTORY,

&c.

175

History of the Progress of Horse Knowledge.

As there does not appear to be at this time any connected history of the advancement of horse knowledge in the world, and thinking such might be useful, I have endeavoured to supply this defect, in an imperfect way, by placing together and arranging, as well as I could, the matter which presented to me, or my reading had supplied me with, forming it into a separate book, and hoping it may in some degree contribute to the better knowledge of this animal, his milder treatment, and the advancement of the interests of society in his use.

My first intention in writing it was merely to give it as a short introduction to the anatomy of this animal as it formerly stood in Rees's Cyclopædia, where it appeared in a very concise manner about sixteen years ago: being desirous of publishing that article again separately, I began upon this history as introductory to it, but finding it extend beyond the limits I had at all intended, I changed my plan, and determined on making it a distinct Treatise, and was obliged therefore to reprint the title and the first two or three pages. Having premised these circumstances, I shall not detain the reader longer by any prefatory matter, or take up his time by the unprofitable ceremonies of an adulatory dedication.

I divide the matter of this History into two parts, in order to give it more clearness ; *the first contains the History of the Horse from the earliest times to the decline of the Roman Empire : the second including from the decay of the Roman Empire to the present period.*

It is not unreasonable to apprehend, that in the very earliest ages of the world, and when man was placed in a state of almost ignorant nature, and surrounded with various animals of whose properties he was unacquainted, that he would require a considerable time in ascertaining their various uses.* The more subordinate animals would, it is reasonable to believe, first invite his attempts at subjugation, and, when grown familiar to them and encouraged by their useful services, he would extend his dominion to the more difficult and nobler objects placed before him : hence it appears very probable (and the most ancient records of any, the Sacred Scriptures, would seem to confirm it) that the use of the ass preceded that of the horse for some time. In these writings we are told that the venerable patriarch Abraham (though probably surrounded with all that the wealth of those times could afford) rode on an ass in going to the Mount to fulfil the awful command of the Almighty in sacrificing his son Isaac; laying thus, by so great an act of self-denial, an acceptable foundation for the true religion. It is also probable that in this eastern part of the world the *camel* was in use before the horse for riding upon, as ten of these were dispatched by Abraham to bring Rachael from her father's house, she being placed on one of them ; not the docility of the animal only, but his back also, seemed formed with a natural saddle for the burden. That the reduction of the horse to a state of servitude did not take place for some time after the first ages, is also rendered probable from his not being mentioned with the other animals in situations where it could hardly have escaped notice had he then been in use ; one in particular we may point out, where it is recorded, that when Pharoah, the lord of Egypt, endeavoured to seduce the wife of Abraham, he set before him for his indulgence the richest of his treasures, placing at his disposal "*sheep, oxen, asses, and camels ;*" but it is singular no mention is made of the horse. That the ass was first used seems farther confirmed in that Jacob's sons conveyed the corn they received in Egypt home to their father's house wholly on the backs of asses. *Genesis*, ch. 44, v. 13.—And, no kind of shoeing being known at this period, he would better serve in rough and ill-formed roads as

* On Adam was graciously conferred by the Almighty the necessary knowledge of these animals. How far this might have descended to his successors we are not informed ; perhaps it did not descend in any considerable degree.

was the case probably then, than the Horse, whose feet, more nobly formed and constructed, are in reality more sensitive and not so obtuse as those of the Ass. The step of the Ass, also, is more exact and carefully made. Jacob, in departing from Laban, placed his sons and daughters on Camels, and it is curious that an exact enumeration of his stock of animals is given with no mention of the Horse among them—200 *she goats*—20 *he goats*—200 *ewes* and 20 *rams*—30 *milk camels with their colts*—40 *kine* and 10 *bulls*—90 *she asses* and 10 *foals*,—so that in this Land of Canaan there is reason to suppose the Horse was hardly in use at this time. In the latter part of the life of Jacob, however, who lived to be 147 years old, we find the first mention of the Horse in the following manner. That Jacob's sons, in order to obtain corn, on account of the famine that prevailed in Canaan, "*took to the Egyptians Horses, flocks of Herds, and Asses, delivering them to Joseph for the use of Pharaoh.*" Chap. 47, v. 17.

And not long after this, from the familiar metaphoric allusion to the Horse by Jacob at the point of death and prophesying the characters of the future twelve tribes of Israel, one might conclude that the Horse had become well known, since he says, "*Dan shall be a serpent by the way, an adder in the path, that biteth the Horse's heels, so that his rider shall fall backwards.*" Chap. 49, v. 17. And Joseph, soon after this, going up from Egypt with the body of his father Jacob for burial in the land of Canaan, "*had with him a large company of chariots and horsemen.*"

This active and ingenious nation of Egyptians, soon familiar with his use, did not long delay to employ this noble auxiliary to the purposes of war and human destruction. And accordingly some reigns after this, or in about the period of two hundred and fifty years, all the mighty host of Pharaoh, with his chariots and horsemen, were, by a signal miracle from heaven, drowned in the Red Sea. This event, according to the best chronologers, happened in the year 3216 of the Julian computation, or 1556 years before the birth of our Saviour.

We are now to pass from these simple annals of nature and truth into the wild and extravagant fictions of the Greeks, who dressed in metaphor and quaint conceits all they received from these Egyptians, as though they were jealous of admitting from whence they really received their knowledge, or at any rate chose rather to cloak it in the language of ambiguity and mystery.

The Greeks, and after them the Romans, impute to *Erichthonius* the discovery of the use of the Horse, or at least of his application to the chariot.

*Primus Erichthonius currus et quatuor ausus
Jungere equos, rapidusque rotis insistere victor.*—*Virg. Georg.* lib. 3, v. 133.

Pliny also says, *Bigas primum junxit Phrygum natio, quadrigas Erichthonius.* Lib. 7, cap. 56.

It would appear, however, from the researches of a learned Antiquary of Berne in Switzerland (Samuel Schmidt), that this famous Erichthonius was no other than the Horse-breaker of the Egyptians, it being the general expression or phrase in this

language of the breaker-in of the Horse, which Grecianized was made *Erichthonius*. He observes that the Thessalians, or inhabitants of Thessaly, were ancient Egyptian colonists, and that two other colonies afterwards arrived in Greece from Egypt, and were distinguished by the titles of the Argos and the Athenian Colonies.

The Athenian Colony had for its leader Cecrops, in Coptic, *Cecrop*, the Greeks always adding an *s* to the final *p*, as in Pelop, Pelops; and in the Egyptian language this name was Sigraph, signifying conjunction or mixture, or of a mixed nature; some believe that he derived it from being of the figure of a Man upwards, and below of a Serpent; others that he obtained this name from being the institutor of marriages at Athens. This Cecropian colony began the Attic æra, and was estimated between 3 and 400 years before the taking of Troy, or about 3132 of the Julian period, or 1582 before Christ. And Honorius, Tricuspheus, and Augustin, say that the Children of Israel passed out of Egypt while Cecrops reigned in Athens. Cecrops was also placed among the signs of the Zodiac for Aquarius, to record that before wine was used in sacrifices, water was employed; for the Egyptians held wine in abhorrence, and hence it became with other nations an abomination, as with the Magi, Gnostics, Arabians, Brachmans, and Monks of China; and God permitted the Jews to use wine in their sacrifices, in order that they might be distinguished from all other nations. After this first Colony of Athens came a second, about 1082, or 500 years before Christ, which was that of Erichthonius or Erictheus. It was during his time, if not his own act, according to Diodorus Siculus, that quantities of Corn were brought into Athens on account of a severe famine that then prevailed, and this favor was conferred on these Athenians because the colony was anciently from Egypt, established by Cecrops. To reward this act, the Athenians made him King, and gave to his brother Butes the priesthood of the holy Temple of Minerva and Neptune. And this Erichthonius, they say, taught the Eleusinian Mysteries of Ceres, perhaps a metaphorical allusion to the corn that he had supplied them with, and the arts of agriculture which he might have taught them.

“Those have erred widely who have derived this name Erichthonius from the Greek language, since in the Egyptian appears to be the natural clue to it. *Erichtho*, the ancient Egyptian word of which the Greeks made Erictheus and Erichthonius, as of Apollo they made Apollonius, is composed of two parts, *eri*, facere, vel *rei alicujus auctorem esse* and *chto* or *ichto*, *Equus*, the Horse, and hence *Erichtho*, Autor Equitatus et Equorum, the occupation constantly ascribed to Erichthonius, as seen in the preceding lines of Virgil. Aristides and others confirm this by observing that he first tamed the Horse and then applied him to the chariot. It was on this account that he was placed among the constellations under the name of Auriga, Agitator, or Heniochus, the driver or charioteer.”

What throws new light on this conjecture and confirms this etymology is, that Erichthonius or Erictheus was one of the surnames of Neptune; hence Lycophron

Tzetzes, Hesychius, and others, say that Erictheus was Neptune with the Athenians. Plutarch also in two places makes mention of Neptune Ericthonius; and Sophocles and Diodorus Siculus attest the fact that he was considered the first inventor of Equitation among the Greeks. Pausanias also speaks of an Equestrian Statue of Neptune at Athens, to account for the ancient surname *ἵππος*, or the Horse, that was given to Neptune.

The Hymns of Homer give two occupations to Neptune, that of Navigation and Equitation, *Διχθα τοι*, &c. and hence afterwards in Italy the Etruscans represented Neptune drawn in a car by Horses, and hence also Romulus dedicated to Neptune the Games called *Censualia*, in which they were used to place crowns on the Horses. And from this the Ancients went still farther, and considered Neptune not merely the Inventor of Equitation, but that he invented the Horse himself and that it was created by him; hence it is common to see in mythological sculpture, Neptune striking with his trident the earth, out of which immediately arose the Horse. Thus Lucan says:

*Primus ab æquora percussis cuspide saxi
Thessalicus sonipes bellis feralibus omen
Exiit.*

And Virgil in the same manner:

*.... Tuque ô cui prima frementem
Fudit Equum, magno tellus percussu tridenti
Neptune!* Georgic, v. 13.

And hence *Pamphilus*, the most ancient hymnographer of Athens, calls him *ἵππων δότερα*, or the Giver of the Horse.

Whence, it might be asked, was Neptune attached to Erictheus? Was it that this colony of Egyptians came by sea into Greece, of which this stood for a symbolical or emblematical representation, and hence Equitation became the ancient emblem of Navigation, or "that the managed Horse appeared to them to be steered by the rein as the ship at sea is governed by the helm?" Mons. Frenet in his ingenious *Reflections* upon the fable of Bellerophon, observes that the Pegasus of this hero was merely a vessel used by him in his expedition, and hence also Neptune in his dispute with Minerva made the *Horse* to rise out of the ground, signifying merely that he advised them to the practice of Navigation: *Minerva*, again, on his part, caused the *Olive Tree* to rise out of the ground, that is, he counselled them to pursue Agriculture.

The wooden Horse of Homer was perhaps no other than a ship or ships which conveyed the troops to the coasts of Troy; as Plautus seems to confirm;

*Nempe Equo ligneo per vias cæreuleas
Estis vecti.*

It appears therefore, in concurrence with History, that on the rocky coasts of Thessaly the Egyptians first landed with their managed Horses, and so this part became renowned for horses and riding, and in this place originated the fiction of the Centaurs, half man and half beast, the rider and his horse formed into one by their fanciful imaginations, which appears also to have had a moral interpretation in the subjugation of the natural will, and so the beast, or the man, was said to prevail.

These Centaurs were described by Homer as inhabiting Mount Pelion. Lib. 2, v. 900.

Here also flourished Chiron, surnamed the Centaur, who is usually reputed a Thessalian, but who perhaps might have been some Egyptian, or at least of Egyptian origin, the name appears to me to strengthen this suspicion, as well as some other circumstances we shall hereafter adduce. There seems to have been with the Greeks a great reluctance of admitting the assistance they derived from their neighbours the Egyptians, and to avoid their acknowledgments, chose rather to refer these aids to fanciful gods, or ideal nymphs. With Chiron both professions were common, the human and the brute: he taught Æsculapius, from whom, it is said, sprang human medicine exclusively considered, as also from two other of his pupils, Machaon and Podalirius.

The computation of the exact period of these times is thus stated in the Short Chronology of Sir Isaac Newton, p. 14.

1035 years before Christ. "Eretheus reigns in Attica."

1034. "Eretheus having first celebrated the Panathenæa, joins Horses to a Chariot."

1019. Solomon reigns and marries the daughter of Ammon, and by means of this affinity is supplied with Horses from Egypt, and his merchants also bring Horses from thence for all the Kings of the Hittites and Syrians; for Horses came originally from Lybia, and thence Neptune was called *Equestris*.—Chron. p. 16.

960. The War between the Lapithæ and people of Thessaly, called Centaurs. P. 23.

After this period our history paces on more certain ground, and her events are no more encumbered and obscured by poetic fictions, for soon after this period lived one of the best writers and best Horsemen that the world has ever yet seen, Xenophon, the historiographer of Persia and of Greece, the hero, the moralist, and the equestrian, and himself leader of the cavalry in the celebrated retreat of the ten thousand armed Greeks to their native country from Persia, after a defeat by Artaxerxes, the Greeks being engaged in the cause of Cyrus, his brother; these, on their return, had to pass through an enemy's country surrounded with innumerable difficulties. His excellent little work *Περὶ Ἰππικῆς*, *Peri Ippikes*, gives us a most exact account of the management of the Horse, and of the practices of his time in regard to these animals. It is a work highly curious on account of its antiquity, and valuable on account of the simplicity and judgment it displays in these matters; the Greeks appear to have been so well satisfied with it, that after him no one appears to have written on the subject in this country. He composed it, as he says, for the benefit and instruction of the young people of the Athenian states, and the following epitome of its contents may be useful to those who may not have seen it, or who may wish to refer to it as containing the sentiments of this extraordinary people at this very early period of human knowledge.

"It begins with his instruction in the purchase of a Horse: the feet are particularly dwelt upon, as

of primary importance, and as there was no shoeing at this time it was necessary these parts should be particularly attended to, and accordingly he directs that the hoofs be thick, strong, and lofty, (that is, not flat,) with the frogs well raised from the ground, resounding to the pavement. He then gives his judgment of what should be the make and form of every part or point of the Horse from the hoof to the top of the head, and in most of these, he agrees with our own notions of the present day. He then passes on to the growth of the foal and the rearing him. Then instructions to the man or boy who looks after him; next respecting the knowledge of the age by the teeth. On mounting and on bits; on viciousness, observing that a contumacious Horse, like a contumacious army, is of little use; therefore his obedience is to be tried on all points, which will also show his soundness. The master to have always his stable within view of his house, that he may frequent it often and see that no food be pilfered or tricks played his horses; for the Horse neglected, the master is often brought into difficulties in his performance. He in a particular manner enjoins gentleness with Horses, and forbids any to approach them with anger. On exercise and food: the feet especially to be attended to, and kept as round and hard and tough as possible, nor is wet to be allowed in the stables to rot the feet; round stones placed for them to stand and to paw upon.* Mouths, how to render them delicate to the impression of the reins. Head-stall not to hurt the ridge or top of the head or ears. *Muscle* not to prevent the jaws from opening, or throat-lash choking them; no curry-comb to be used along the ridge of the back; on the saddle; head to be washed, not curried; *fore-top* to be kept short of the eyes and wetted, the *mane* also; hairs not to be too scrupulously removed from the inside of the *ears*; *tail* and *mane* to be washed often, to increase their growth; *mares* shorn of their mane before they will admit the ass; daily washing of the hoofs not recommended;† *perineum* to be kept clean; *hand-rubbing* of the limbs much recommended; on approaching and on leading horses; on biting him; not to lead him by the reins; on mounting in the Persian manner; not to act angrily with horses, often repented of; nor by stripes make them approach fearful objects, but to make them go from them rather; on mounting with the spear both right side and left; position on horseback; how to hold the reins; on bits; on turning and wheeling; on dismounting; on leaping; ditching; instructions for seat in leaping; exciting and soothing sounds; the fierce horse not to be bought, nor the lazy; on parade and show; bits described; further description of bits and their proper use; elegancies with horses; how to defend the neck in battle; on armour; horse's armour; thighs how to defend; legs and feet with leather gaiters; the curved sword; the spear; the long javelin, and how to send it forth with effect.

One writer appears to have even preceded Xenophon on these subjects of Horses and Equitation, as he is quoted more than once by him, this was Simon of Athens. A brazen statue of a Horse, Xenophon tells us, was placed in the Eleusinium in honor of his dexterity and excellence in the management of these animals, and the book he wrote was concealed or lodged in a hollow cavity of the pedestal. No part of his work has come down to us, but Hierocles I observe has quoted it as late as in the fourth century.

Xenophon wrote also another work on these subjects, The *ἵππάρχιστος*, or *Duties of the Master of the Horse in the Army*; pointing out the manner a good Cavalry should

* This, it must be obvious, would be useless in the modern management of feet, as the shoes would entirely prevent their operation. Fortunately for them the antients knew nothing of the deplorable state to which the feet are reduced by modern shoeing, and the trials of patience this occasions to the rider, and the severities of bits, spurs, and whips, which are necessary to overcome the effects of their stunned, benumbed, and contracted feet.

† It probably rendered the hoofs too soft for their use without shoes, but with us an advantageous practice.

be formed, kept up, and be used. The feet are also again a subject of primary consideration in this work, their going without any defence to their feet at this period rendered this attention necessary.* In this work are many remarkable expressions of submission and reference to the divine will, that one would hardly suspect we were reading a pagan writer of this early period. Another work also his industrious pen has left us, not very remotely connected with this subject: *The Κυνηγετικόν, or Treatise on Dogs and Hunting*. He begins it by telling us, that Dogs and Hunting were invented by the divinities Apollo and Diana, who bestowed them first on Chiron, who transmitted them to his pupils, Æsculapius, Peleus, Telamon, Theseus, Ulysses, Castor, Pollux, Machaon, Podalirius, Achilles, and others, all of whom he says were graced and adorned in their acts by these divinities; he then further tells us that this Chiron and Jupiter were brothers but of different mothers, one of *Rhea*, the other of a *Naiad* Nymph! and may we not observe, that this anonymous lady was not one of the Nymphs that haunt the shady grove or chrystal fountain, but was a *Naiad* of the briny ocean, that is, came out of the sea, which sea, may we not conjecture, divided the rocky shores of Thessaly from Egypt, or in plainer words was a swarthy inhabitant of the banks of the Nile, transported in a vessel to Greece, and the wily Greek, with ambiguous reluctance, half acknowledges and half conceals the fact by this mysterious way of dressing it up. I need hardly remark that Xenophon lived about four hundred years before our Saviour.

As the arts generally follow in the train of riches and power, so Greece declining and Rome advancing, we are next led thither in pursuing our history. Towards the close of her commonwealth, two famous writers appeared on Rustic Affairs, *Marcus Portius Cato*, and *M. Terentius Varro*; but their chief aim being to treat of Husbandry, Gardening, and Rural Affairs, the Horse obtains only an incidental notice in their works, but sufficient to require our attention. The work of Cato is curious, as the most ancient of these, and, among many useful observations, contains what is omitted in the others,—the charms and superstitious incantations of his times, used in order to success, some vestiges of which are handed down to us at this day in this country. He was the father, I believe, of the noble patriot. His book is simply divided into 162 Chapters, the particulars of which we omit, in order to a more extended notice of Columella, the most perfect of these rustic writers. Varro's work is in three books, each divided into many Chapters: his first book is wholly on Agriculture, and an enumeration of the authors then extant; the second is on Animals,—the ox, the horse, the mule, the hog, the goat, the ass, &c.; and the third is on the management and observances of the Villa or Farm, and of all kinds of poultry, bees, fish, &c.

During the usurpation of Julius Cæsar and his successor, Augustus, Virgil appeared,

* The reader is referred to a short treatise on the knowledge of the ancients respecting shoeing at the end of my work on the Foot.

and beautifully handled these subjects of rural affairs in verse, in his *Georgics*; he also only makes mention of the horse incidentally and as a necessary appendage to agriculture. Also about the same time, *Cornelius Celsus*, a valuable writer, lived and wrote on the diseases of Horses and Cattle, which, except some few extracts in the Byzantine Veterinarians, appears to be lost; we learn from Columella that his work occupied five books. After these in Rome, succeeded *Lucius Junius Moderatus Columella*, who lived in the reign of Tiberius, and was born in Spain as a roman subject; and who having more plainly and usefully written on these affairs than any of the others, we consider it worth a short epitome, as affording a specimen of the arrangement and matter of these rural writers. His book seems to have been intended for the use and information of the wealthy Romans, who possessed country seats and villas. It is comprised in twelve small books, to which a thirteenth is added on the culture of trees:—

The first six books contain an account of the authors then extant on these subjects of agriculture; he then treats of soils, water, situations, descriptions of persons necessary in the culture of the villa, on fodder, on seeds, &c. and largely on the culture of the vine, elm planting, and other trees and shrubs, the olive, the apple, on grafting trees, and on the cytissus.

In the following six books he treats of *oxen*; on choosing them; their draft and their food for the different months of the year; diseases and cure; on the pestilence, gripes, swelled tongue, fever, cough, abscesses, and lamenesses; *sparteum opus* for binding up their feet; the scab; bites of rabid animals; coriago or hide-bound; ulcerated lungs; tumours of the neck and palate; foot cut by the ploughshare; horns broken; dislocations and strains; bites of vipers and adders; bites of the shrew mouse (*mus araneus*); eyes inflamed; epiphora; leeches in the throat; description of a Roman Trevis; of the shape of the bull and of the cow; on the yearly selection of cattle; on sheds and stables; on calling them at close of day from the woods, "*per sonum Buccinae*. Age for breeding." On the worms of calves; on castrating them. On *horses*; good food requisite while the young foal is growing; rich open pastures rather than mountainous districts; a short sweet grass best; to be restrained from covering; subject to hippomanes; on their fecundation in hot climates by the south-wind! admission of the stallion; he believed that by tying up the left testicle a male was obtained, the right a female! desirable qualities in the foal, small head and black eyes; and the rest of the points are very much as stated by Xenophon, concluding in the same pointed manner respecting the hoofs that they be "hard, high, (not flat,) concave beneath; rounded coronets above the hoof, not too large; the whole body large, lofty, and erect, with an appearance of life and energy, and though long, sufficiently rounded; manners gentle, easily excited, and as easily appeased; indications of the age by the teeth; on the necessary care with horses; wheat better than barley for lean horses; on rubbing and currying them; dry stables strengthen the hoofs; floor of the stalls of oaken rafters; on fatigue and heat; inability to stale; pains of the head; jaws; arms; on bile; worms; cough; impitigenes; scabies; pupulæ; intertrigo; flies; cicatrices; dolor oculorum; refusing food; git, and on oestri."

On *Mules*. To chose their stock and breed them; their medicine; De Asello, a meaner kind of *Ass* from *Arcadia*; on *sheep*; on rams; kinds of sheep, Milesian, Calabrian, Apulian, &c. red from Asia; Pusula seu sacer ignis; Bolus Mendesius, a famous Egyptian writer on sheep, falsely called Democritus by the Greeks; diseases and remedies; management of the folds; on *goats*; on cheese-making; on *swine* and their medicines; castration; on *dogs*; his good qualities, form, and colour; diseases and remedies; canker of the ear; ticks and lice; mange; country amusements; fowls, their kinds; hen roosts; food; on sitting the eggs; of eggs; cramming fowls; on doves; on thrushes; on peacocks; on ducks; quails; on fishes; on bees; Chap. XI. on culture of the garden; Chap. XII. on candies, pickles, and preserves.

Such is the matter and the arrangement which Columella has pursued, the chiefest of the Roman agricultural writers, and whose work will ever be curious as giving us the practices and opinions of this ancient period in these affairs.

There is however another rustic writer of Rome, who has some passages respecting Horses, and this is *Palladius*; he evidently succeeded the former writers, following their plans and mixing in the same manner agriculture, horticulture, vineyards, animals, and the internal domestic arrangement of the villa. It is not exactly known in what period he wrote, some believe in Hadrian's time, and that he was a contemporary of Pliny; his own expressions seem to show that he was of Sardinia or Naples, and his language too, as Gesner observes, bespeaks a later period of Rome and is less chaste than that of his predecessors. He has divided the business of the farm and of the vineyard according to the respective months of the year. Like Vegetius and the other Romans, he instructs the bottom of the stable to be planked with hard oak and not with round stones, as Xenophon proposes. In the business of the month of May, he describes the operation of castrating, and by confining and crushing the cord between two sticks—a mode of doing it that was a few years ago introduced amongst us as a new thing; he afterwards however, describes the mode of dividing the spermatic chord with a red hot blade, and at once finishing the pain and operation, and, as we believe, very judiciously gives it the preference. Columella also recommends crushing the spermatic chord in the same way; and which, he says, was recommended by Mago. Bees appear to have had an uncommon share of the attention of Palladius, and his remarks on these will perhaps be found more close and accurate than any other of these ancient writers.

The only African work on these subjects is by *Mago Carthaginiensis*; he is quoted by Columella and probably only preceded him a few years. The work is lost; there is, however, a few scraps of his to be seen in the collection of Ruellius, fol. 37, 2, &c. which are not of great promise, and lead one the less to regret it, especially as Columella and Vegetius both had the advantage of his writings. It was originally written in the Punic tongue, as Varro informs us, and was contained in 28 volumes or books, which were translated into Latin by order of the Senate.

Rome extending her empire to weakness, divides, and from her eastern side grows out a new kingdom in Greece, Byzantium is made the seat of a new dynasty, under the appellation of Constantinople; and the cavalry of the armies of Constantine were, for the first time in the world, attended by men exclusively employed for this purpose, whose writings, having descended to us, form the collection we are about to describe; and again the Greek language becomes the language of this art.

Rome after this produced no writer of note on the horse till Vegetius in the fourth century, but the growing empire of the east under Constantine and his successors next draws our attention in that direction, as in point of time, the Greek

Veterinary writers preceded Vegetius, who was the last of the Roman or ancient writers on these subjects.

The original manuscripts from whence the Greek veterinary writers are taken are still existing in the Royal Library of Paris, and may perhaps have been in France ever since the taking of Constantinople by the Gauls in the thirteenth century, and as far as such writings are useful may contain passages of considerable interest, if intelligent and properly qualified persons were employed to make a selection. They informed me at the library the character in which they are written is very ancient, but twice that I have been to Paris, very desirous of seeing them, I could not obtain permission, it being vacation time and the library shut. The fragments published were selected by Ruellius a learned monk, by the orders of Francis, king of France, first in a Latin translation in folio, in the year 1530, and afterwards in the original Greek text in octavo, in the year 1537, both splendidly printed, so as scarcely in this respect to be surpassed by any thing of the present day.

The number of writers in this collection are about seventeen, and they appear to have been Veterinarians employed in the armies of Constantine and his successors; and several of them, from the epistolary form in which they are written, appear to have been addressed to their superior officers and friends. Two of them, however, have regular prefaces, Apsyrtus and Hierocles, as though, at some time or other, they had formed entire and separate works: the chief of these is Absyrtus, who shows more address than the rest, and after him Pelagonius, Eumelus, Hierocles, Theomnestus, &c.

We learn from Suidas that Absyrtus was a Bithynian, and served under Constantine in the Scythian war, and we gather from his own preface that he was stationed on the Ister or lower part of the Danube. Hierocles is said to have appeared in the courts of law, in trials respecting these animals, and did not, like Theomnestus and Absyrtus serve in the armies. The period in which the others lived there is no means of ascertaining, nor is it of much consequence; their papers are merely curious as giving us the state of knowledge in these arts in Greece, eight or nine hundred years after Xenophon and Simon, and they no doubt possessed the works or traditions of Chiron and his successors. It is by no means certain that some of these Byzantine writers might not have followed Vegetius, as he only quotes two or three of them. Ruellius instead of giving the labors of each separately has thrown them altogether, according to the matter treated of, which is commodious in one sense, that of comparing their opinions and prescriptions; but a separate exhibition would have been more simple and better, as he sometimes for want of knowing the subject separates matter that should have been connected, being misled by different names for the same thing.

One may gather from this collection that the work of Hierocles was written in two parts, since the preface to the second part is here preserved, in which he tells us

the singular fact, that one Micon preceded Simon in this line of writing, though much accused of ignorance by him, and it is fair to conclude with reason also, as Xenophon nor any other writer besides has ever deigned to mention him. The prescriptions of these Greeks are ill-digested farragoes, composed of many incongruous ingredients, some but little known, others altogether disused at present in medicine. In the administration of remedies of a surgical nature they were more happy, especially in topical bleeding, which they well understood, from every part of the body.

We shall conclude this account of the ancient writers by returning again to the West, in order to consider Vegetius, whose work of all the ancients is of the most interest, as it is confined solely to the consideration of the veterinary animals.

Flavius Vegetius Renatus appears to have lived in the fourth century, in the time of the emperor Valentinian the Third, and besides his book *De Arte Veterinaria*, he wrote also a celebrated work, *De Re Militari*, much quoted and esteemed for its conciseness and accuracy, on the weapons and mode of war of the ancients, which he dedicated to the emperor Valentinian; some have doubted if they are by the same writer, but from the age, style, and manner, there is little room to doubt of this I believe. He seems to have been an affluent Roman, and to have kept Horses for his recreation.

His work *De Arte Veterinaria* is of sufficient importance to deserve a particular notice, more so than any other of this early period, and those who do not read the Latin language may have a tolerable notion of its matter and manner from the following brief epitome of his first book. This work has, however, come down to us in a very corrupted state, and is worthy perhaps of being published more correctly in a British edition; this may be done in very many places, by collation with the Greek writers, and especially with Columella, from whom many of the passages are almost literally taken, and exhibit plainly the corruptions of his careless transcribers. His work is divided into four books, the first of which is subdivided into sixty-four chapters; the second into sixty-five; the third into eighty-five; and the fourth is shorter and divided into twenty-eight chapters or rather scraps, for some of his chapters are only a few lines in length, and are excerpta rather than chapters. His prefaces or introductory chapters to his four books are remarkable for strong and elegant language, and carry with them sufficient evidence of their author. Better apologies for the cultivation of the science have, we believe, never been penned.

The works of Chiron seem to have been in existence in Vegetius's time, as he often quotes him, but of him and Absyrtus he does not speak in very high praise, "*eloquentiæ inopiâ ac sermonis ipsius vilitate sordescunt*," Lib. I. Pref. In his first chapter of the first book he gives the indications of the animal being ill: in his second chapter he numbers the disorders, making of them the mystical number seven,—*the moist; the dry; the subcutaneous; of the joints; hardness of skin* (elephantiasis); *of the loins* (subrenalis); *and the Farcy*. In chap. 3, he describes the symptoms of the first of these

disorders, which is our *glanders*; and says the ancients called it the *profluvium atticum*. In chap. 4, he describes the *morbus aridus* or *broken wind*. Ch. 5, *morb. subcutaneous*, an *inveterate and ulcerated mange*. In ch. 6, the *articularis*, which, from his description, appears to be two or three diseases mixed, of which *hide-bound* is the most prominent. Ch. 7, the *morbus farciminosus*, or the *Farcy*. Ch. 8, the *morbus subrenalis* or *strain*, apparently, or affection of the loins from lumbar knots perhaps.* Ch. 9, *elephantiasis*, *hide-bound and emaciation*. He then gives seven chapters to the cure of the seven disorders: beginning with the first of these, the *morbus humidus* or *glanders*, and recommends for it—

“The injection of wine and oil made warm into the nostrils, and to tie the head down with a cord to his legs, forcing him so to walk that the humor shall run out; if blood flows it is a good sign! Chap. 11, cure of *broken wind*: he compares it to a consumption, and orders for it anointing the whole body with oil, and oily remedies internally. Chap. 12, cure of the *subcutaneous disorder*; a rowel (fistula) between the fore-legs and belly, while the moon is on the wane, as the practice is in India, he says, and the humor will come away of a golden hue! tithymal root to be inserted in the opening of the rowel; *consiligo* herb and the *diapente*† with old wine; *opium* and *bay berries*, or laurel and wild cucumber-leaves cut small, also warm water and barley-meal or wheat, and to stand in a warm stable; dry food but not green, and sweating exercise that the humor may be dried up. Chap. 13, cure of *articularis*: he here introduces a curious and favorite metaphor of his, “*ut amaritudinem morbi herbarum amaritudo compugnans possit expellere*,” not sufficiently aware perhaps of the dangers of a metaphor in physic. Chap. 14, cure of *farcy*: the name he observes is derived from *farci*men, any thing stuffed or crammed, from *farcio*, occasioned by humors forming between the skin and flesh and making collections in various parts of the body, diminishing in some places and breaking out in others. Though the disease be contagious, it may be cured if taken early, and while the internal viscera are sound: if in the very beginning of the complaint, blood may be taken, as also on its termination but not otherwise. These collections to be opened with a cautery, and it is more efficacious if done with a cautery made of copper: the wounds or openings to be dressed with tar, honey, and oil, mixed; cathartics and medicines of the bitter kind are to be administered, and *diapente* with wine, which is useful in all the diseases of the animal; afterwards the roots of elder (*ebulus*) a pound, with three gills of the best wine to be given during three days: after, one ounce of the best aloes, the same of centaury, and of *oponax* well rubbed together and given in the wine in which the elder roots have been infused, made warm: these portions to be given during three days, that by their laxative effect, the humor may be carried off; let him be exercised to a full sweat and often, and during the administration of these remedies, let him remain night and day in the open air in the pastures, that, profiting by the herbs he may choose, and dried by the heat of the sun, and by the fresh breezes of the night and morning dews, the disease may be more easily overcome. Chap. 15, cure of *subrenal disease*, (loins): as the subrenal disease is more full of danger, so it requires more skill to understand it, for the kidneys of the animal are affected and dissolved by it, on which account, though his front parts be sound he drags his hind after him. In this way it will be relieved: from both sides let blood be taken, or from the thighs copiously, which mixed with very sharp vinegar, is to be anointed all over the body, especially the loins; the *diapente* to be given him frequently, also very warm clysters by the anus; aloes, pyrethrum, euphorbium, pennyroyal, castor, mustard-seed, pounded salt, well pounded together, to be given in bran-tea, warm if required; warm clysters that the humors may pass off in the dung; besides, let the

* These grow from the inside of the vertebræ from too hard labour, uniting the vertebræ by ossific deposit.

† We shall give the composition of the *diapente* hereafter, and the famed quadragian or four horse powder.

loins be vehemently and often rubbed with laurel oil and hot wine, that, from within and without, this sharp disorder may be expelled; also let the loins be cauterized, that the disease may be dried up by the force of the fire. Chap. 16, *cura elephantiasis*: in the cure of this complaint we are not by healing the external ulcers to drive it inwards to the viscera, and so produce danger; but to let blood from the plate vein (matrix), and mixing it with sharp vinegar, rub it over the whole body, also from the palate, and if the strength permit it from other parts of the body, and to be rubbed in again with vinegar. Colts also taken away from their dams and tied in the stable are apt to incur this disorder, not having the usual exercise to promote their digestion. Not only elephantiasis (a sort of inveterate mange), but all murrain disorders are helped by the diapente, and no Veterinarian is to be without the following portion to keep by him: myrrh, frankincense, pomegranate-rind, pepper, saffron, red acacia, pontic wormwood, serpyllum, betony, centaury, sagapenum, saxifrage, and peucedanum, these well pounded together, sifted, and boiled in honey, are to be kept in an earthen or glass vessel, and whose virtues increase by long keeping, of which medicine a table-spoonful heaped is a dose, in a gill of warm water, mixed with three ounces of best oil, to be given during three days; when it begins to succeed, let it be given every day with wine and oil; which drink is as good as the diapente given when the animals are seized with sickness. Colts escape through the advantage of their youth, but often however, die of it. Chap. 17, *of the malleus or murrain*,* what belongs to the cure of this terrible disorder, it is necessary abundantly to expose; for where the mortality is so great, it behoves us to omit nothing. For the destruction of innumerable herds of cattle in the fields, as well as in the stable are occasioned by it, and by the unskilful and the negligent is imputed to a necessary fate, or the divine displeasure. Although, as we have asserted before, one animal being seized, it shall spread to all the rest; separation therefore is necessary, and burying the dead at a great depth in the ground, for the smell of the dead carcasses, will be fatal to the remainder. Many causes have been assigned for this disease, some apprehending it arose from too great exertion and fatigue, or exerted efforts of too violent a kind; or from the heats of summer or winter chills; or if animals are not allowed to stale in proper time; or if they receive their corn while sweating; or if allowed to drink whilst hot, the bladder being full; or if forced after drink to sudden exercise; or from corrupted hay or barley. Indeed all these things are to be avoided as producing mischief, but the murrain especially proceeds from noxious air; for if the Southern or African wind blows, even years after, returning again it shall occasion pestilence among men and animals, destroying them by an infected, corrupted air. Wherefore the most approved drinks are necessary to assist and strengthen the health on such occasions some we have given already, others we select from every writer. The remedies against general disease are: the seed of the Egyptian gourd, that is *coloquintida*, broken and pounded, a small cupful, adding a gill of best wine, shaking them together and then straining it, and to be given through the right nostril, that it may get at the viscera, it is also most useful for the dysentery; another of a meaner kind but not less beneficial is the green roots of the wild cucumber pounded and macerated, during one night in water, then strained, of which juice three table-spoonfuls mixed with nitre and with wine, and if the animal be free from fever, made warm, to be daily administered for seven days; also nitre well pounded and the sliced roots of wild cucumber in warm wine; also the roots of elder and of the nettle infused and strained. The following is also much commended: savin, trixago, centaury, aristolochia, bay berries, myrrh, finely powdered, a table spoonful to be given in a gill of wine. Against the attack of all diseases, bleeding from the neck, the palate, or in whatever part the disorder appears; if in the face, from the head; if anteriorly, from the arms; if posteriorly, from the hips; the blood so taken, mixed with sharp vinegar, to be rubbed over the whole body. The roots of panaces and the sea eryngium, fennel, aloes, pounded and sifted, and mixed with a gill of meal, to be given

* This dreadful disease, often the scourge of the South of Europe, seldom visits this our healthy isle. It seems inflammatory in its commencement, but soon assumes the asthenic collapse with the most putrid appearances. It visited, however, this island about the year 1745.

the animal three days in hot water. Pelagonius believes the following beneficial against all sorts of disorders : if you take a young stork before it can fly, and put it into a pipkin and close it up, and burn it and reduce it to powder, kept in a glass vessel, a large table-spoonful to be given in a gill of wine. But Chiron, the centaur, among other compositions above described, advises a young puppy scalded alive and depilated and boiled till the flesh leaves the bones, which being carefully separated, the flesh together with the broth, along with some dripping of meat, old wine and oil, and preserved with pepper and honey ; to be given to every animal two small cup-fulls, warmed every day, through the mouth, till they recover. The head and legs of a kid also served in the same way ; a cock also, or a white hen, served in the same way ; the root of the herb tithymal* also, boiled with sweet wine, is beneficial. And to animals labouring under glanders, having a greenish or white humor running from the nostrils: human urine or goats urine, two cup-fulls with wine to be given him, and a glass of rose oil mixed with it, and thrown up the diseased nostril, which will strengthen the lungs and dry the nostril of the discharge. Chap. 18, a yearly physic for Horses: the heads of the ulpicum, or great garlic, as the French call it, and of sagapenum to every head half an ounce, pounded, with a glass of the best oil, and mixed with half a pint of water, to be given through the nose during the calends of July, that is, at the beginning of the dog days, the 7th and the 6th ; of which, if three portions are given, it will keep the cattle an entire year free from disorder.

Ch. 19. *The composition of a suffiment or fumigation, against the murrain.* You shall choose a hollow or low place in the ground, and enclose the animal all round, whether sick or in danger of being so. Take origanum, garlic, mint, pitch, pucedanum, castor, and opopanax in equal quantities, mix them ; and take as much as can be held on three fingers, and put it on live coals, and bring the animal's head and nose over the fumes in the dark, and the sharpness of the smell passing through his nose and mouth, and penetrating to his lungs, shall fill them, and will even excel medicine.

Ch. 20. *Another and stronger suffiment, which will also remove witchcraft and evil aspects.* Sulphur vivum, pitch, opopanax, acanthus, galbanum, castor, crude iris, perhaps the orris-root, as it is usually called by us, (*ypreos*,) sal ammoniac, cappadocian salt, hartshorn, male and female agate, blood-stone, iron-stone, silver-stone, little sea-horses, (*equuleos marinos*,) sea tails, sea nails, sea grasses or berries, deer's marrow, cedar, tar, cattle-fish bones, gold, and *balluca*.† All these mixed and set fire to will remove diseases as well from men as from animals, and will drive away devils, prevent hail-storms, and purify the air. But, if the above stones cannot be found, or, on account of the price, are omitted, the other articles will suffice.

Ch. 21. *On judicious bleeding.* All medicine, whether human or of animals, will be subject to err if a rational system does not guide it ; but, if the disease and plan of cure agree, the cure is rendered certain. There is to many members and to many diseases a general remedy, that of withdrawing blood, according to the season, strength of the animal, and the age also, which the skilful veterinarian industriously considers ; and if sound reason in this case does not guide him, instead of good, he may do much harm, &c.‡

Ch. 22. *On the diligence necessary in the occasional removing of blood.* Many believe it necessary yearly to bleed their animals in spring, and then to send them to grass, lest the old and corrupt blood mixing with the new, heating their nature, should endanger their health, and produce debility. Older and more skilful authors have forbid this depletion without a positive indication for it, lest, by becoming a habit, if omitted to

* A kind of spurge, still bearing that name in France.

† As none of these prescriptions are ever likely to be imitated, I do not tire the reader with the proportions or quantities of each, but give them numerically that he may entertain some notion of their multifarious pharmacy.

‡ I omit some parts of little interest, that this extract may not become too long. It will suffice to afford us a fair notion of the nosological and physiological reasoning of the fourth century, and of the articles of their pharmacy and association of them, which no description alone could exactly convey.

be done, it may produce disease. It is, therefore, right, that young animals that are well, should lose no blood, except from the palate, from which, as well young as old, the humour is to be abstracted, that the head, eyes, and brain, may be relieved. To old animals it is not useless to bleed before they go to grass. It is, however, customary with all that are bled, that they be kept the day before on lower diet, that, debilitated by the evacuation, they may not have their digestion disturbed.

To bleed, we must place the animal on level ground and bind his neck round with a chord, the tighter it is done, the more conspicuous will be the vein. Then, with a sponge and water wash and clean the vein, that it may rise more to view. With the thumb of the left hand, you press on the vein, and render it still more tumid. Then make your stroke with the fleam (*sagitta*) in the direction of the vein, having well sharpened it. Observe not to press the hand so hard as to hurt the throat or to cut the windpipe, for such may endanger the life of the animal. The vein being opened, give some hay or corn to the animal to eat, that, by the motion of the jaws, the blood shall flow more copiously. If the blood appear black and corrupt, on its flowing more pure you shall remove the food, and tie up the vein with a *fibula*. Put a plaster on the vein, that it may quickly heal, though some prefer chalk. Afterwards let him stand in a warm but shady place, and let him be fed with meal only, or, if in season, the softest hay, for seven days and nights, offering him as much water as he will drink. Wheat meal is preferable to barley, but barley if the other is not to be had. Also, observe that is the best which has grown near the sea, because it is more laxative and removes humors. The blood from the opened vein is diligently to be collected, and mixed with oil and vinegar, or other medicine that the case requires, to be rubbed over the body, especially the part it is taken from, or where the disease is thought to be: for, from certain natural reasons, as some believe, the blood itself, poured upon the affected members, excels medicine and dries up the disease, which is a dexterity in the curing that should not be omitted. Besides, after the interval of a few days after bleeding, bring forth the animal to the sun, and take blood from his palate, about the third ridge of the palate, beyond the tushes: let him have soft meat and bran, and his head be held up on account of the flow of blood. After some days, let him return to his barley, but by little at a time, increasing it every day. Afterwards, if the weather be warm, let him be led to the sea or the river, and, after washing, be carefully covered warm. With wine and oil let him also be diligently rubbed in the sun, that his body being warmed may repel or carry off the disorder, which being done, the very useful horse may again return to his labour and exercises.

Chap. 23. Castrated animals are not to be bled: for this reason, that they have lost part of their strength with their testicles, and therefore become further debilitated by it. Asses, for the same reason, are not to be bled, because they have naturally less blood and smaller veins. Chap. 24: Stallions are also not to be bled, for part of their strength and blood is carried off by coition. If they cease, however, from covering, they fall into blindness, because what they lost by coition now flies to the eyes.

Chap. 25. In what diseases and from what parts blood may be taken. In diseases, and where the whole body is affected as in fever, the blood should be taken from the plat-vein.* In diseases of the head, in staggers, madness, stomach affections, falling fits, frenzy, planet-struck, or furious, blood is to be removed from the ears, or, which is better, from the temples. Three fingers' width below the arch of the temples, and below the artery, is the vein, and, from both, blood is to be drawn. However, in affections of the eyes, the angular veins proceeding from the corner of the eye are to be opened, four inches below the orbit. Where there is want of appetite, or swelling of the arteries or jaws, or dejection of the head, the blood is to be removed from the palate. But where the lungs or the liver are affected, or the viscera connected with them, blood is to be taken from the chest, in the flexure where it is conjoined to the shoulder. If the arm is affected, from the fore-arm, the blood is to be taken, the veins being on the inside of it, two or three fingers below the swell of the muscles, and six above the knee. Let these veins be struck cautiously, because they are mixed with the tendons; but if the joints are disordered, or have been wrenched or strained, the blood should be removed

* From the French word *plat*, *flat*, as is the inside of the horse's thigh.

from the vein of the fetlock, three fingers below the joint, which veins are to be touched with the greatest caution, on account of the tendons. Or, if the foot hath been strained, let the blood be taken from the coronets. Chap. 26, *On taking blood from the hoof, or from those who have cast their hoofs*: Horse's feet having a suffusion or deposit of humor, or the hoof distorted by violence, or have been long lame in the feet, are cured in this way. You shall rasp down the whole hoof to the quick, paring the frog, vehemently binding a chord below the fetlock, cutting round the sole, and removing the hoof in part from the coronet. You shall then introduce a sharp knife round the sole where it has been cut away, and unloosing the chord below the fetlock, the blood will be seen to flow: after it has flowed sufficiently, mix some of it with salt, and afterwards anoint it with vinegar and oil, and tie it up carefully, making him a shoe of Spanish broom, that the hoof, rid of its humors, may grow up. This, however, is so painful an operation, that only one foot can be so treated at a time, that, in case the other foot is affected, it must be done as the former grows up and is healed.

The remainder of this chapter is so obscure and little interesting that I omit it.

Chap. 27. *From what parts blood is to be taken with horses affected with lock-jaw, convulsions, colic, or gripes, or have the subrenal distemper*. With such the tail is the part to bleed from, though, as the intestines are concerned, it is thought best to do it from these viscera. If taken from the tail, thus proceed: bend back the tail to the loins, and divide the skin four inches from the anus, where there is no hair, laying some flat weighty body upon it, tying it up afterwards. If from the viscera you would remove blood, in the groins on the right and left side on each thigh you find the vein, and after removal of the blood put some chalk upon it. If the hocks or haunches are affected, draw the blood from the hocks: the same vein runs down the inside as comes from the viscera. It must be done cautiously, on account of the nerves and tendons; afterwards bandage it up.

The following chapter respecting firing is truly curious, and points out to us satisfactorily the date of its commencement.

Chap. 28. In the cure of animals, authors tell us there are two remedies, the lessening the mass of blood by which morbid constriction is relaxed; and burning by the cautery, by which the relaxed are constricted. But, although the utility of bleeding is most evident, the use of firing, *it being a very new mode of cure*, remains to be laid open; for firing binds up parts relaxed, attenuates the inflated, dries up the moist, dissolves coagulations, cuts fleshy tumors, relieves old pains or aches, recalls to their natural state parts disordered, removes unnatural excrescences, and removed and scorched, prevents their return: for if you with the red-hot iron sear through the skin, the disease is concocted, matured, and dissolved by the benefit of the fire, and runs out with the humour through the openings made by the cautery. After the cicatrices are healed, stronger and tighter is the part rendered, and the skin becomes almost indissoluble. But it should be known that a cautery made of copper is more effectual than an iron one. If the disorder be in the head, let the neck be burnt; if in the kidneys, the loins. Sometimes punctures or points are made, sometimes lines, and at other times like a feather, or fingered: and in this is the skill of the veterinarian known—that he cures the animal without disfiguring him; according also to the parts in which the disease resides, or according to the nature of the skin, the cautery is used more deeply or leniently. It is, however, to be recollected, that parts luxated or removed from their proper places are not to be fired; but it is well, after they have been reduced to their situations, and strengthened by bandages and corroborant plasters, to use the fire in the hope of a lasting cure: and, above all, the veterinarian is to be warned not to be in a hurry to cauterize; but, after bleeding, drinks, ointments, injections, and other medicines, have been tried and failed, that he should resort to the firing.*

* Vegetius originally designed to end his first book with this chapter, but, as he himself states, is induced to continue it farther, for the sake of inserting all that is most important in his first book, as he observes, it will

Chap. 29. *On the nature and cure of fevers.* Whatever diseases are of most danger, and are obscure and most difficult of cure, I insert in this first book, that they may be the more easily found, and may occur without giving the reader much trouble. 1st, therefore, of the cure of animals attacked with fever; for it is supposed they cannot sustain the heat which accompanies it more than three days, within which time, if they are not relieved, they die. It behoves us, therefore, to give the causes and signs of this complaint, and afterwards the medicines. In fever the head is held low, almost to the ground, the eyes will be closed, the lips hanging down; miserable sadness and heaviness of the whole body follows; the testicles enlarged, hang down relaxed; the limbs glow with heat; the veins beat with more violence; the breathing is quicker and hot; frequent, soft cough; his pace vacillating; no appetite; great thirst; he is watchful, and without sleep. The cause of this is from too much labor and neglect afterwards; sometimes, also, from being over-heated, or much cold, or bad food, or sudden chills after sweating, or from heated new barley. The following is the customary cure: take blood without delay from the face, the temples, or the palate; he must abstain almost entirely from food the first day; he must be presented with the very best hay or softest green herb, little by little; he must rest from all work, and be put aside during a seasonable time, and be led about with walking exercise, and to remain in some warm stable well covered. When he begins to be better, let him have grass cut small: if this cannot be had, barley softened by maceration, bruised, with the husks taken from it, in the manner of ptilan or gruel; a small quantity at a time, and very often.

Thus we see that this ancient writer of nearly two thousand years ago, has described the symptoms of this prevailing complaint of the horse with as much accuracy as any of our modern farriery-books. If he had substituted pneumonic inflammation, or visceral inflammation, for the ambiguous term *fever*, there would not be much to alter or improve; or if he had written symptoms of the fever which attends visceral inflammation, it would have been still more explicit, perhaps. This excellent description of the symptoms or indications of visceral attack of inflammation is copied from the Greek veterinarians, Absyrtus chiefly; so that Vegetius has, I think, been too severe on this author, in the remark we have formerly quoted. Absyrtus adds to the treatment very judiciously I think, "that his hay be sprinkled with water." Indeed these early Byzantine veterinarians appear not to have been unworthy the trust reposed in them, in the care of their army horses.

A Roman horse rubbed over with blood, oil, and vinegar, must have been a singular sight; yet such a practice is not altogether indefensible; the oil and vinegar, and friction, would no doubt excite the circulation of the skin powerfully, and with the warm coating of the glutinous blood, form an artificial covering for him that would keep up the warmth, and not readily transmit the heat, and that both together would not in a slight degree tend to relieve internal attacks of inflammation, but the appearance certainly must have been most uncouth. They had very few foot cases to trouble them, the great bane and opprobrium of modern practice. The term *mulo medicina* was applied by the Romans to this art, no doubt to avoid the harsher term

will be more read; and certainly turning over manuscripts must have been more troublesome than our present printed books, which would justify his remark. This I mention because Schneider, a German, in his Leipsic edition, has divided this book into two books, and so has thrown the whole work into confusion.

equi medicina, or *equina medicina*, as being too inharmonious for use. The French are puzzled at this day, in the idiom of their language, to use the word *veterinarian* for a practitioner of horse medicine, and resort to the term *medecin veterinaire* when applied personally; and in the modern Italian by *veterino* is signified, the ostler or stable boy, rather than the veterinary surgeon.

Vegetius seems to have apprehended that inflammation in summer was different to inflammation in winter, and, therefore, has his fevers in summer, his fevers of autumn, and his fevers of winter. Sometimes they ordered their drink to be given through the left nostril, in which there was intended a sort of charm.

There seems nothing particularly worth our notice in the succeeding chapters till we arrive at the fortieth, which is on the abdominal diseases, and where he describes the *aquliculus*, as he calls it, or stomach, and its offices, with great truth.

In Chap. 41 he more explicitly describes the gripes, which the Greeks called *Emphragma* and *Chordapsos*, which he says was very frequently fatal with them. He seems to have made two or three diseases of it, whether it originated in the stomach, colon, the longanion, or rectum, or the ilium, which is obscure; as also that their names for the bowels were not the same as ours at this day. Having, however, myself formerly written an express essay on this complaint in which their treatment is mentioned, I forbear to say any more of it here. Chap. 43: This disorder is again treated of under another Greek name *Strophos*, and he recommends puncturing the abdomen, but not the intestines, to let out the air generated!

Chap. 44. *Of worms, bots, tape-worms, and lice.* The bots adhering to the anus he thus describes: *Invenitur humor in ano fabe coctæ similis*, a humor like a bean that has been boiled, sticking in the anus which is no other than the *hæmorrhoidal bot*; for a particular account of which, and its whole family, I must refer the reader to an essay published a few years since in the Linnean Society's Transactions, vol. 3, and afterwards separately, where several species are described, with their amusing and curious history, and mode of propagation. He makes the same remark as our noble poet, Shakespeare,—that the empty stomach and hungry, starved horse is most teased by the bots: *Jejuna animalia ex hac necessitate vehementius torquentur*; *nam cum his deest cibus magis vitæ consumuntur a vermibus*. He recommends green and bitter oils for their cure with the pontic wormwood: also, nitre and castor will destroy them, he says; and in the next chapter, 45th, he recommends attacking them by clyster; using oil, sharp vinegar, and bitter herbs, especially stating that the horse should be placed on a declivity when receiving the clyster. At the conclusion of this book, among other bitter medicaments, he recommends the *aloe epaticum*, the first or second mention of it in his book, which would seem to show that they were not then acquainted with its invaluable purgative qualities to this animal.

Chap. 46. He treats of *intestinal mucous balls*; recommends their being sought for by the hand introduced into the rectum. He farther speaks of removing them, by a sharp instrument, and afterwards healing the wound, into the bladder, as he apprehends, confounding these concretions with real bladder calculi, with which they have no correspondence: we have called them for distinction *Enterocalli*.

Chap. 47. He returns again to *emphragma*, or gripes, from collections in the rectum, recommending clysters, and their removal.—Chap. 48, 49, and 50. The same.—Chap. 51. *Suppression of urine*, often imagined, but is a truly rare disease with horses.—Chap. 52. Collections of worms in the rectum and bots.—Chap. 53. *De syncopatis et confixis*; animals, perhaps, that have become stiff in their limbs and muscles, through cold and exposure. Cure: Anointing all over with wine and oil, and long continued friction, a warm stable, and a soft bed: drinks of myrrh, tragacanth, saffron, melilot, anagallum, male frankincense, mixed in warm water, honey, and the rose oil.—Chap. 54. *On nasal hæmorrhage.* Cure: Green coriander juice,

or of the herb *porrum* injected into the nostrils.—Chap. 55. *On redundant blood, or plethora.* Cure: Abstinence both of meat and drink, a soft bed to induce sleep, bleeding from the plat-vein, and a drink of coriander, porrum, trixago, centaury, and nitre.

Having finished with their most fatal and difficult disorders, he proceeds very judiciously to the preservation of their health; for it is better, he observes in this excellent chapter, by diligence and study, to maintain the health we have, than to be employed in bestowing medicine on the sick.

Chap. 56. *On the industry and care necessary to maintain animals in health.* The stable, therefore, should be well placed within reach of the master's frequent visits; and to keep their feet in good order, the floors should not be of soft wood, but of the hardest oak, and well compacted together, for this kind of wood will render their hoofs as hard as stones.* A trench, also, with a drain, should be formed for carrying off the urine. Their manger should be kept clean, and free from all kind of hurtful filth, and every one be well separated and distinct from the other, that the visits of more eager horses may be thus prevented: the racks, also, not placed so high as painfully to stretch their necks, nor so low as to strike them with their heads or eyes. Light, also, should be plentiful in a stable, lest, on going out, the sun should be too powerful for them, and injure their eyes. In respect to heat, in summer, both by night and day, they should be in open airy places; in winter the warmth should be moderate; for too much heat, while it contributes indeed to fatness and good appearance, is very hurtful to nature, and produces disease; and if they are then exposed to sudden cold, they immediately experience illness from not being accustomed to it.

Care is especially to be taken that the hay, the straw, or the clover, be untainted, sweet smelling, and clean; and the barley, also, not powdery or with stones intermixed or gluey, fermented or spoiled by long keeping, but fresh from the granary, and bright by its newness. The water transparent and cold; also, constantly and liberally to be bestowed from a flowing spring, for such cannot easily be contaminated. Twice a day they should be well groomed and rubbed all over by several hands; and custom teaches us that it relaxes and supple the skin, and leads to fatness and good condition. The barley should be given not once nor yet twice, but by several small portions in the day, for so they will digest it better; for, if they take a large quantity at once, they often transmit it, whole and undigested, with their dung. Near the stable should be a dry place, strewn with soft straw and dung, where the animals may roll themselves before they are fed, which sort of exercise contributes to health, and exhibits any invading sickness; for the animal in this case will not roll with his accustomed vivacity, and should be immediately separated for treatment; and to which end it much contributes if the animals be permitted often to lie down and be quiet for short periods. The want of skill in the groom or superintendant, and their frequently entering the stable, disturbs and debilitates them; and the wretched ways of servants, and their impatience with them; and, in the absence of their master, they will violently ride the horses, and not only whip, but spur them also, riding for wagers with one another, and contending in the most vehement manner, nor restraining their horses; and, if injury arise to the owner, it is only subject of merriment and congratulation, which to prevent should be punished with the greatest severity, and men of moderate habits and good experience should alone be employed to handle them. After sweating, if it be summer, sour wine may be used to wash their mouths; if in winter, brine. Also, wine and oil should be poured with a horn down their throats, in summer cold, in winter warmed; three ounces of oil to a sextarium (gill) of wine in winter, in summer two only. Nor should we cease our solicitude, but give the following drinks, which soon remove any languor, evacuation, cough, or internal suffering:—Sulphur vivum, myrrh, raw eggs, with half a pint of the very best wine. Another more expensive drink for all complaints, old coughs,

* The reader need scarcely be reminded, that, as they did not shoe, this was necessary to smooth and harden their hoofs.

consumptive, broken winded, or other concealed affection;—Pisane, linseed, fœnugreek, saffron, pickle of fat pork, or if wanting, a boiled goat's head and feet and leaf of the intestines; hyssop, german shiells, scallions, figs, rue, and green bay berries; long grasses, garlic, goat's suet, pennyroyal; these boiled together till the flesh leaves the bones, continually supplying fresh water to prevent its burning. After carefully straining it, add gum dragon and dried raisins to each drink, with six eggs on the second day; rose oil and butter on the third; *anagallicum*, starch, and the quadrigarian powder and bean flower; give it to the animal fasting, with walking exercise after; and till the seventh day he must abstain from meat and drink!

This, strange as it may appear, was no doubt their frequent practice early in the attacks of disease. The remainder of the chapter, which is very long, is much of the same complexion, and is hardly worth transcribing. After disease, he enters upon those important parts, the feet; giving directions for preventing their breaking, and wearing away too fast, and they relied on the following singular composition, as useful in this respect: *garlic, rue, allium, old axle-grease, and ass's dung, boiled together*, and applied in an evening after the day's journey; another compound was, *tar, worm-wood, stale oil, sharp vinegar, mixed and boiled together*.

Also, in this curious chapter, which informs us of their general stable-management, occurs directions respecting the legs, strictly ordering that the pencil of hair at the back of the fetlock be not on any account removed, observing very justly its natural beauty. Of the management of the mane, also, he speaks extensively, remarking "that it is customary to crop it, or cut it off. Many (he observes,) for coach and even saddle-horses, cut it off close, which will make it grow thicker, but to a noble horse such cutting is truly a deformity." Others cut it so as to imitate an arch; and some, after the manner of the Armenians, leave alternate locks of hair; but more graceful, he says, is the Persian method lately introduced, taking away all the left side of the mane very curiously, and leaving the right entire and untouched. And it is extraordinary, he observes, that they should adopt the very plan that Virgil had proposed: *Densa juba et dextro jactata recumbit in armo*. Virgil however, I apprehend, merely meant that this naturally beautiful part should be combed out to the right side, but not cut away as he describes the Persians to do, from the left side.

Chap. 57. *A drink for summer use*. Saffron steeped in old wine, tragacanth dissolved in warm water, with the herbs, porrum, apium, portulaca, and goat's milk, eggs, rose oil, honey, and raisins, pounded together, to be given for three days successively.' He recommends, however, half a pint of fresh cold water to be given after it, and very appropriately we believe.

Chap. 58. *A winter drink*. Old wine, oil, pepper, rice, cerefolium, tragacanth, fennel-seeds, bay berries, honey, eggs, and raisins.

Chap. 59. *A drink for autumn and spring*. Costus, cassia fistula, celtica, petroselinum, betony, liquorice, sagapenum, spica indica, saxifrage, eupatorium, melilot, illyrian iris, centaury, gentian, aristolochia, amomum, scinoanthos, asarum, aloes, myrrh, opopanax, dragon-root, saffron, castor, pontic wormwood, digested with the very best wine.

Chap. 60. *A drink for all Seasons*. Very much as the former.

Chap. 61. *On difficulty in staling*. The following is a ready remedy for the use of the traveller. Mix

the earth on which a horse has staled with wine, and, straining it, pour it through the nostrils ; so shall it immediately provoke urine.* Also, a head of garlic inserted into the anus or within the sheath. Also, powdered frankincense, mixed with an egg and wine. Also, a decoction of beet-root and mallows. Also, a live bug or fly put into his ear. Also, a most certain remedy is to use friction above the external opening of the urethra.

Chap. 62. *On gripes.* Seeds of rue, well pounded, with hot wine. Also, decoction of beet-root, or its expressed juice mixed with nitre, to which oil must be added, and be injected, as a clyster. Or, if these cannot be had, honey, with a third part of pounded salt, formed into masses of the size of an egg, must be placed in the rectum, the animal being put in an inclining position. Also, the bone of a snail, which no unclean hand hath touched, or any tooth, or the earth, tied to the navel, will cure them.

Chap. 63. If the horse's back has been hurt by the panniers, or the saddle for want of due stuffing, or a too heavy load, if it be recently done, boil the stalks of onions, or the onions themselves, in water, and apply them hot, and keep them on by a bandage. Also, pounded salt mixed with vinegar, adding to it the yolk of an egg : anoint therewith, and it will dry up the injury.

Chap. 64. *On making the much approved diapente.* Gentian, aristolochia, myrrh, bay-berries, ivory shavings, diligently pounded, and mixed in equal quantities, prepared and kept in readiness, that if the animal on a journey is looking sad, or with a staring coat, or is attacked with any disorder, immediately he is to receive a table spoonful, mixed in a gill of best wine for three days, or even if he be at work, it will restore the internal ailment. It is an approved remedy. To the horse that coughs, give a half pint of raisin wine, and it will cure him.

He then concludes his book with the usual apologies, and stating that in the next he will treat of their distempers from the crown of the head to the sole of the foot. There is, in my opinion, no sort of doubt that it is the proper conclusion of his first book, and not of the second, as Schneider has endeavoured to make it.

His second book I shall not attempt to follow with a translation, as what I have already extracted from this writer will sufficiently show the state of the art and the prevailing opinions of those days, and the last improvements of the art among the ancients. His preface to the second book is, however, interesting, and worthy our consideration. He tells us the art had very much declined in his days, from the small encouragement given, and profits attached to it : and that many, following the example of the Huns and other barbarous nations, to avoid expences, were used to turn out their animals into the pastures during the winter, and give them up entirely to chance, which, he observed, profited few and injured numbers ; since the finer breeds of the Roman horses could not endure the hardships of these horses of the barbarians ; and he concludes with the reasonable observation that vile indeed must be the horse that is not worth the pittance of his medicine, or if one is lost, would it not by its price have paid for the cure of a great many sick ones ?

The ancients seem not to have had any regular purgative for the horse : the roots of the wild cucumber seem to have been the chief article they employed with this view,

* This, though a filthy remedy, is surpassed by our modern blacksmith physicians, who administer not only human urine, but human ordure, as a medicine to this patient animal.

and lettuces, and what they called *cauliculi*, probably a plant of the cabbage kind, was another laxative with them. Vegetius directs them to be given with kitchen grease, (*liquamine*.) Also, a plant they called *asininus* they employed along with the wild cucumber; and in a green state, cut fine and boiled in oil: one may suppose, from their accounts, it took some time to operate. They also used with this view, honey, white hellebore, and scammony, given in white wine. In order to force a perspiration, he not only orders a warm stove, but also the use of a hot dunghill, the horse being covered over perhaps in it, a useful hint possibly to our modern practitioners.

The ancients do not appear to have understood the use of blisters like ours, of cantharides, for horses, but they amply supplied their place by the use of the cautery.

Vegetius, through this second book, tenaciously adheres to the plan he had laid down of beginning at the top of the head, and going regularly to the feet, which serves as a sort of index in looking for the disorders; so we have the pole evil and the diseases affecting the brain, the eyes and the throat in succession, and then those of the neck, shoulders, arms, knees, hips, hocks, swelled legs, mallenders, the *podagra* or gout, founder, hoof abscess, bruised and abraded feet, tender, bruised, and gathered heels, that is, of the intertortional point of the sole. *On casting or losing the hoof. On worn feet and soft-footed horses.* He passes, however, afterwards to the injuries of the back, which is a slight departure from his proposed arrangement, and which he treated of in his former book; and then concludes with the art of making the hair grow on bald parts, and on making white hairs black, and black hairs white. Such are the contents of his second book.

The preface to his third book does credit to him as a man of feeling in describing the invaluable services of these beneficial creatures; he observes, that, in composing his book, he has yielded to the honest desires of servants, collecting from all authors, and compiling it in language that he hoped the scholar might not despise, and the simple herdsman be able to understand; but, above all, his incitement to write was, the utility and excellence of these animals, without which the earth could not be tilled, or the human race be supported, the vineyards would lie idle wastes, the plough become useless, and waggons inert machines, and every thing heavy would become immoveable but for their labors. He also informs us that the cattle were protected in the Roman government by severe laws, to prevent their being abused, and that it was death by their statutes to ill-treat them. Columella, I observe, has devoted forty-five pages to the ox, thirteen only to the horse, and six to the mule; so that we may apprehend the degree of estimation in which they were held by this difference of attention. These ancients also believed that justice had fled from the earth, indignant at witnessing the unjust and cruel treatment of these most worthy creatures, and so the ox became a

constellation, and was placed "*inter fulgentissima sidera, participes cæli*," amongst "the brightest of the stars, an associate of heaven."

This third book is on cattle chiefly, and is the most corrupted of any, and by collating it with Columella, near a hundred useful corrections can be made in it, as it is very much taken from him. In the 18th Chapter, the singular expression of "*glante ferreo*" occurs, which would almost lead one to believe he alluded to an iron shoe; though the expression is no where else to be found; and he adds, "*vel si defuerit sparteæ calcabis, cui lemniscos subijcies.*" These *lemnisci* were probably a flat plate of metal or wood or leather, attached to the broom-twig socks by ties. If, however, nail-shoeing had been known, a writer so exact could not have passed it over in silence; nor could they have gone upon their flat causeways in iron shoes, for their causeways more resembled our flag-paving than our present roads.*

In Chapter 24, he has well described the lock-jaw (as we call it) of these animals, under the better title of *morbus roborosus*, or *oaken distemper*; since the muscles in this complaint, not only of the jaws, but of the whole body, become rigid and hard as wood. It occurs, I have remarked, much more frequently in the northern countries of Europe than in the southern, and very often kills. From what I have observed, it is not by the constriction that the animal dies, but by the inflammation of the lungs, the blood being driven apparently by the constriction upon the interior; bleeding copiously and sweating ointments, seem to cure it best, as far as my experience has gone. Powerful friction, with hot ointments, the ancients very judiciously recommend; and Vegetius quotes the practice of some who employed very hot air to surround them with, or hot sea or river sand, leaving the head and nose only out, till they thoroughly sweated them. Oil and wine mixed, and well rubbed against the hair, he states, and with truth I believe, to be excellent.

The rest of the chapters I am obliged to pass over in silence, with some interesting matter there is also a good deal of repetition of what occurs in the preceding books; and pass to the fourth and last book; nor can I concur with those who have considered this fourth book spurious, though inferior to the others, there are marks enough, I think, of its being the production of Vegetius, and especially the preface.

In this fourth book Vegetius has attempted, perhaps for the first time it ever was attempted, the anatomy of the horse; and like a first sketch it is bad enough. It consists in little else than numbering the bones, and telling us there are one hundred and seventy bones composing the body of the horse—so simple are first beginnings of human knowledge in the arts.

* An ample dissertation, on the knowledge of the ancients in this respect, may be consulted at the conclusion of my Work on the Foot; and other particulars again in the Stereoplea.

He then measures the length of the various parts of a middle-sized horse ; but it is unintelligible. Next he speaks of the quality and number of the tendons (*nervorum*), which is the most defective of all. He then enumerates all the external veins, with tolerable accuracy. He next adverts to the signs by which the age is ascertained, which is borrowed from Columella, but is not equally clear ; for he who writes from an actual observation of nature, almost always renders things clearer than he who copies only. He has attempted, however, a novelty in giving the black markings of the teeth which succeed the cavities, which do indeed afford an indifferently good means of judging of the age, after the ordinary marks or the cavities are gone. He then speaks of his own travels and experience : “ *Quæ res nos compulit, qui per tam diversas et longinquas perigrinationes equorum genera universa cognovimus et in nostris stabulis sæpe nutrivimus;*” which thing compels me, who have travelled into many and far countries, and have known every kind of horse, and have kept many in my own stables, &c.” But the most interesting part of this book is an account of the various races or breeds of horses then in estimation in Rome, and their characteristic make and qualities.

The horses of Rome he divides into three classes : for war—the circus—and the saddle. For *war*, he observes, the *Huns*, *Turingian*, *Burgundian*, and *Frigiscian* horses excel. Next, the *Epirotic*, *Samaritan*, and *Dalmatian*. For chariots, the *Cappadocian*.

In the *circus* the *Spanish* horse excels all others, and also the *Sicilian* ; although the *African* horses of Spanish blood are the swiftest of any.

For the *saddle*, above all, the *Persian* horses ; being the easiest in carriage and most soft in their step : afterwards come the *Armenian*, and *Sappharenean* ; nor should the *Epirotian* or *Sicilian* horses be despised, though not equal to them in their deportment, manner, and form.

“ The horse of the Huns is known from the other breeds by the great curving outwards of the front of the head : eyes prominent, small nostrils, broad jaws, and stiff neck ; mane reaching to the knees, ribs wide standing out, back hollow, tail with copious long and curly hairs ; shanks stout, fetlocks small, hoof large and spreading, flanks hollow ; body angular, with projecting points of bone ; no furrow or channel in the buttock, no knots or rounded swellings or fulness of the muscles ; length exceeding the height ; belly, when empty, and the horse is out of condition, hanging low ; bones everywhere large ; an agreeable leanness of appearance, which rather contributes to them a grace than a deformity ; a temper gentle and cautious, patiently enduring the wounds and casualties of war. c.c

“ The *Persian* horses, in stature and fashion, are much the same with the other kinds ;

but the great difference consists in their walking with a grace peculiar to them: their step very short and frequent, which agreeably elevates and delights the rider; nor can it be taught by art, but appears to be the pure gift of nature. They are between the *Colatorii** and those vulgarly termed *Totonarii*;† the step being of a middle kind, and though unlike either, they are believed to have something in common with them both."

"With the Persian horse, it is ascertained that his step is more pleasant in proportion as it is shorter: in long journeys their patience is very enduring; their temper is haughty; unless subdued by continual exercise, apt to be vicious and stubborn; nevertheless, they are sensible and intelligent, and, which is surprising, in their impetuosity they do not lose sight of propriety. In their carriage, their neck is curved as a bow, which brings the chin almost to touch the breast. Next he treats of the length of age which different breeds attain to. He then takes a summary retrospect of his labours, and proposes to give what useful prescriptions still remain to be exposed, observing, that the *mulo medicus* of his day was too fond of stuffing his prescriptions with expensive and numerous drugs through a too great desire of profit. For he says, very justly, "*Constat namque, non tam multis neque preciosis speciebus, sed paucis et ad causam.*"

Then follows, what he conceived, a most useful composition for horses—*Chiron's drink for refreshing them*, which will sufficiently satisfy the reader of the gross ignorance that prevailed in those times, and how the feelings of these animals were sported with.

Pisan or *gruel* a quarter of a pint, *linseed*, *saffron*, *hog's guts* well washed, or a *goat's head*, with the feet and belly; put them into a pipkin with two handfuls of *hyssop*, *German shells*, *figs*, and *rue*, *laurel berries*, *ductyls*, *garlic*, *goat's suet*, and *pennyroyal*, to be boiled till the flesh leaves the bones, then strain, and add *tragacanth* swollen by steeping in water, *raisins*, *eggs*, *rose oil*, *butter*, *anagallicon*, *starch*, *bean flour*, to be mixed and given with a drenching horn for three days, then after an interval of seven days to be repeated, in order to keep off distempers! This was their famous *diapente*. It is, indeed, to be suspected, that the very same motives for drenching these poor animals with nonsensical compositions, existed in those times as in the present; viz. to gratify the cupidity of those who looked after them; for little or no purpose could such things be of to the animal, but must certainly disgust and

* *Colatorii*, perhaps from the frequent and distinct drops made by a filter, to which their pace was quaintly compared; and hence also, from the same suggestion, they were called by others *Guttonarii*.

† *Totonarii*, perhaps from *Tot*, many or frequent, or as we say, *tot, tot, tot, or dot, dot, dot*; meaning small distinct paces or divisions, or portions of any thing in quick succession of time.

nauseate him. Other prescriptions, equally elegant and efficacious, follow against worms, general disease, and witchcraft; then comes the once famous *quadrigarian* or four-horse powder, also, of the noted Chiron's forming, consisting of *tragacanth, aloe, myrrh, costus, animum, cassia, gentian, birthwort, centaury, betony, saxifrage, elder, opium, abrotanum, eupatorium, cardamum, spikenard, celtic nard, asarum, carrot, castor, opoponax, galbanum, stritium, panacis roots, liquorice, wormwood, peristerium juice*: these pounded together, to be kept in a glass or earthen vessel for use. This prescription I have given in order to exhibit a large portion of the antient artillery of their pharmacopœia. Other prescriptions follow these, equally elaborate, and formed still of other articles, so that nearly all the known products of the earth were in use for medicine in these times, jumbled together. *Compositio caustici*, cap. xvi.; also of Chiron, similar to our strengthening plasters, or, more vulgarly, a charge, of *Jew's pitch, galbanum, &c.* I merely introduce it to show in what a very different sense the word *causticum* was used by them. Under the term *malagma*, is given also the ingredients for a strengthening plaster, as we call it. And under *Collyrii fistularis*, a composition for old fistulous ulcers, our *Ægyptiacum* is seen, formed chiefly of metallic oxyds, *copper, vinegar, and honey*. Under the term *Syncrisma* is found their digestive ointment; and a drying ointment occurs under the term *Traumaticum*. And after are seen the *Collyria*, or eye-washes of *Absyrtus, Pelagonius*, and *Chiron*, of *burnt nuts pulverised, manna, and honey*; or, *pepper, honey, and saffron*, and *powdered cuttle fish*. Numerous uninteresting prescriptions succeed these, and conclude the work, which cannot profit us much, but must ever be valuable, as a curiosity, in preserving to us so large a mass of their opinions and modes of treating these useful animals at this early period.

It seems singular, that the Grease of horses, so common a complaint with us, is nowhere described in Vegetius; it is, indeed, much less common on the continent than it is with us in England, where its occurrence is very frequent, especially about the fifth year of the horse's age, and in the autumn more particularly. If at this time he is fed rather high, and is exposed to dirty roads, and to have his feet and legs wetted, and not carefully rubbed dry afterwards, he will be almost sure of it. The French have no better name for it than *eaux des jambes*, or watery legs, nearly synonymous to dropsy. The Greeks, however, from whom Vegetius compiled, have sufficiently made mention of it under the terms, *ρευματοσ εν ποσιν, Σειρασ*, and by Absyrtus, *χειροματοσ*; and informs us the Romans called it *Suffragines, suffrago* being the *fetlock* of the horse. There is no doubt this secretion is of a specifically poisonous nature, and the progenitor of the vaccine, if not by some modification, of the small pox; the one preventing the access of the other, proves sufficiently their relationship and

analogy. I may also remark of this singular disease, the Grease, that it is allied to Farcy, and I have seen it alternate with it, one appearing as the other was suppressed; so that it may be one of the forms of this Proteus-like disease of farcy. Its cure appears to consist in keeping the parts clean and warm; and, in the first stage, with bleeding, purging, and emollients; afterwards aromatics and tonics internally, and astringents topically, assiduously and carefully applied, to reach the very bottom of the chaps.

PART II.—*The Progress of Horse Knowledge, from the Decay of the Roman Empire to the present time.*

AFTER Vegetius, who lived in the fourth century, there followed a period of darkness of more than a thousand years, and of loss to mankind in respect to scientific advancement; consumed in wars of the more barbarous northern nations against the more luxurious inhabitants of the south, overturning their settled habits of idolatry and government, and opening, as it appears, a way for the growth of Christianity; but soon were misapplied its mild and humane dictates, and they endeavoured, by unlawful means, and force of arms, to carry on its benign principles: and in this error commenced the bloody wars of the Crusades, which occupied nearly the whole of this long period, under the pretence of driving infidels from the *holy land*. Had they possessed the reflection and religious knowledge of our immortal bard, they would have saved themselves all this waste of blood and treasure; who has observed—

“————— that God attributes to place
No sanctity; if none be thither brought
By men who there frequent, or therein dwell.”

MILTON, xi. 836.

We may remark, that it was during this long period of the obscuration of knowledge, and at an uncertain date, that the present art of nailing iron round the feet of horses for their protection, was discovered: at first it was done occasionally only, and afterwards permanently; and this practice at length became general throughout Europe; and it

appears to have been brought into this country about the time of William the Conqueror, if not by himself. The protection it afforded was only attended to, nor was the slow mischief of its effects perceived till lately, or understood at least; bringing to the horse more sufferings than all his other cruelties and wrongs put together.*

During this period of darkness also, the Veterinary Art ceased to exist as a profession, or was so feebly practised, that, on the discovery of the art of shoeing, what knowledge remained of it was easily transferred to the working smiths, who, it is probable, alone could be found to engage in the practice of this art. Its sister science, human surgery, (it can hardly now be credited,) underwent a similar fate; and, for the want of schools to teach, and professors to practice, passed into the hands of the barbers, from whom it has not been entirely removed till within the last century. These smiths, under the name of farriers, became from habit and the custom of mankind, in seeing them so employed, as it were, the legitimate sons of Veterinary science: their labours, through a long period of years, have not advanced the science a single step; but they were necessarily employed when there were no others to practise it, as being more likely to be skilled in these matters than those less deeply engaged in them; though it would be seen on reflection that the good practice of medicine, even on brutes, would require as much the knowledge of anatomy and of the principles of medicine, as the same practice in the human being. Now, the word *farriery*, we may observe, universally employed in this country to signify not only shoeing, but the whole Veterinary Art, is a corrupted and barbarous mode of spelling the word *ferriery*, as it is immediately derived from *ferrer*, French, to shoe a horse; and *ferrum*, Latin, iron; and should signify no more than what the word implies—the practice of making and applying the iron shoe to the horse's foot. And in altering the mode of spelling this word, which we propose to do, we commit no violence on the language, as the most ancient English authors did so spell it.

After Europe became more settled, the revival, as it is called, of letters and learning took place about three or four centuries ago, and the art of printing was used, there came also along with it a more true basis for the repose of knowledge, or mode of enquiry and reasoning; this was by a sedulous attention to facts, phenomena, and experiment, and a closer reasoning deduced from them; instead of the syllogisms, sophistry, and wild opinions of the schools, embarrassing and fettering human sense. And this principle established, has brought about and secured a lasting dominion and triumph over darkness and error; and, in pursuing which, we are now daily reaping the most beneficial effects.

* See proof of this in my Dissertation on the Foot and Shoeing, where it is demonstrated by actual experiment. 4to. 1809.

In Italy appears to have began this revival of letters; and here, also, commenced the first solid work on this art, and which, though roughly executed, deserves great praise: it was *The Anatomy of the Horse*, by Ruini. It is followed, also, by *the Diseases of the Horse*, in six small books, the whole clearly arranged, and with coarse wood-cuts.* It surpassed any thing we had in this country, I believe, till Stubbs' work appeared.

Of this date and period also were the learned works of Conrad Gesner,† and of Aldrovandus,‡ replete with learning and quotations from the ancients, where this animal is mentioned in any way, arranged in methodical order under different heads, which must have cost no small labour of research. It is true, these writers did not exclusively consider his shoeing or his diseases and medicines, which is chiefly our aim; but they mixed these incidentally with their materials, and viewed him only as an individual among the whole race of quadrupeds, which, as natural historians, they professed to treat of; on account, however, of his high value, they considered him more largely and attentively than any other of this order of animals.

A work also appeared in France about this time, of a singular character, written also in the Latin language, by Laurentius Ruisius, as it would appear from the preface of it, put into this dress by a Monk, the prior of a convent near Bondi. It is a work far from contemptible, but disfigured in its commencement by plates of uncouth bits for horses' mouths—the fashion of those times, and detestable enough. The latinity is very coarse, but it has some good remarks for this period, in treating diseases,§ and it must have been the best work of its day, though the remedies and operations are often uncouth and cruel. The use of aloes, as a purgative, is not mentioned in it; indeed, the exact period and circumstances of the introduction of this medicine, I am at present unacquainted with, but suspect it to be of comparatively modern date. In Chapter 25, on purgatives, he recommends grass, entrails of fish, the tench or barbel, gourds, and melons also, for this purpose, after Chiron. A long tedious chapter on generation is seen, in which he seems to say, that after ten years they are useless for this purpose! He does not appear to know the age of the horse by the teeth, beyond seven years; and it would be waste of time to go into any criticisms or notice of the particular parts of it. The last chapter (the 181st) curiously concludes with the parts of the horse that correspond to every sign of the Zodiac; as Aries, the head; Taurus, the neck, &c. This work may be considered as

* Carlo Ruini, *Anatomia del Cavallo*; folio. Venet. 1599.

† Conrad Gesner, *Liber de Quadrupedibus*; folio. Tiguri, 1551.

‡ Ulysses Aldrovandus; folio. Bononia, 1599.

§ Laurentii Ruisii *Hippiatria sive Marescallia*. Paris, 1531.

holding a middle place between the ancients and moderns. The terms used in this work for the diseases, have a striking resemblance to the names used for these complaints in modern English, only they are formed here into doggrel Latin, which would seem to show that our horse phraseology was much derived from the old French of this period, and singular it is that modern French resembles it less than our English.

Four years after the publication of Laurence Ruse, Ruellius published his learned work, the extracts from the Greek Veterinary MS.S., which, though sometimes quoted by the author—we have next to consider, yet lay, for the most part, it is probable, in the closets of the learned, little known or understood by the occupiers of this profession of horse medicine. So far our history has depended upon the labors of the continental nations of Europe, we now pass to the productions of our own island.

The first work that appeared in England worth noticing, was published in the year 1609, in the reign of Queen Elizabeth, printed in small quarto, and black letter, it is entitled, *The four chiefest offices belonging to Horsemanship: that is to say, The office of the breeder, of the rider, of the keeper, and of the ferrer. By Master Blundevill, of Newton Flotman, in Norfolk.**

Blundeville seems to have been a man of some learning, and his work is not in that conceited and knowing way which his successors of the next age fell into; he has, however, fallen into great mistakes in his first book in quoting the ancients, calling the Persian horses, Parthian; and the Hunnish horses, Hungarian,† &c.

In his second book, he gives us figures of a multitude of horrid irons for torturing Horses' mouths, the rage of his day, where violence and cruelty supplied the place of sense and science; yet he seems aware of their folly, for, in concluding, he says "*The true art of riding shall not need the help of so many bits, but only of these three, that is, the canon, the scatch, and the whole port with smooth melons, or with olives; which three bits, with art, doth suffice to frame any horse's mouth, of what sort so ever he be.*" His third book is on *dicting* Horses, and contains also the nonsensical jargon of the day respecting the temperaments, as entertained perhaps, by the physicians in those times. On dicting Horses, he seems to favor the opinion of a hearty feed at night and plenty of water, and but little during the day. In this book also, he directs that the Horse-shoe should be made thin and straight on the sides, and surely a more mischievous direction could not be well devised for ruining the foot; as any authority, therefore, in the matter of shoeing, he will scarcely be considered.

* The very first and oldest English work on this subject is, "The Propertys and Medycines for an Horse," 4to., printed by Wynkin de Worde, about the year 1500. This work not having fallen under my notice, and being more limited in its matter perhaps than the above, would not be so proper an object for remark.

† Perhaps from strangely apprehending that the Huns were a people of Hungary.

His next or 4th book is, on Curing of Horses and Shoeing them; for his plans of cure he often refers to the ancient writers and to Laurence Ruse, but most often and with apparently more steadfast faith, to his old friend Martin Ghelly, as he says, commonly called Martin Alman: on one occasion and one only, is to be found the aloes prescribed, to the extent of an ounce for a dose, and as a purgative; yet his general directions in this respect, are after Laurence Ruse; and in one place for a purge, he recommends a quart of decoction of mallows with a pint of oil or like quantity of fresh butter. He seems to have been more of an amateur in these matters than a practitioner, and was but little acquainted practically with horses' diseases; he seems to mistake glanders for an affection of the tonsils, and strangles for the same as *angina* or *quinsie*, of the human. He makes the ancients, in many places, say things I do not find in them, and Laurentius Rusius he constantly quotes under the name of Russius, as though he really had not seen the original work: it is indeed scarce; the only copy I know of it in this country, I purchased from a book-stall several years ago in Tottenham-court Road, for eighteen-pence, which has served for the above observations. He describes the diseases of the gall, that is, of the gall bladder, though he honestly remarks none of his predecessors had done so, p. 38, ch. 88. He, therefore, from inattention, first propagated this error; the horse, remarkably, having no proper gall bladder. He also recommends the ignorant and dangerous practice of opening the synovial galls of the hocks and fetlocks from hard work, called wind galls and thorough pins, which must have been fatal to most so operated on, from the excessive irritation which the exposure of these cavities to the air always occasions.

The word *frog* does not occur in this book, but *frush* is constantly used for it, and when discharging, *running frush*. His practice for this complaint was most mischievous, "to cut away all the horn so as to make it raw," and then apply salt and the white of egg! He has a long chapter on *purgatives*, but treats of them in a very evasive manner, *aloes* is certainly spoken of with the rest, but not prominently, that they evidently were in great uncertainty about it at this period, and of diuretics they say nothing. The term *horseleachcraft*, supplied in these days the place of our modern word *farriery*. The word *coffin* occurs, for the entire wall of the hoof, and hence the included bone came to be called with us the *coffin-bone*, a name it still retains, though the hoof no longer receives that appellation. In shoeing, his directions are very wretched; among other blunders he orders the two nails next the heels to be first driven! None of the shoes represented by him are fullered, that is, grooved round the rim for the nails, and the holes for the nails of his shoes are carried round the toe. And though he recommends in his second book, a shoe made thin and straight on the sides, yet in his plates of shoes, there is not one of this figure.

He has also given a shoe with a lap-joint, riveted by a small iron pin, in case of a lost shoe, and to accommodate different feet, and recommends gentlemen learning to nail a shoe on, in order to use it, observing that in Germany it was the practice so to do, with those who were very fond of riding, so that it was intended merely as a resource, to be removed as soon as a proper shoe or smith could be found; indeed, such a shoe could not be worn many days, if many hours, without coming asunder. No principle of elasticity in the foot being known, it was, in fact, hanging against the walls a mere curiosity.

About fifty years after Blundeville, another work of some learning appeared on this subject, written by *Leonard Mascall*, a small 4to., in black letter, and of the date of 1662. It is entitled *The Government of Cattel, divided into Three Books: the first, of Oxen, Kine, and Calves; the second, Discoursing of the Government of Horses, with approved Medicines against most Diseases; the third, of Sheep, Goats, Hogs, and Dogs, &c.* He seems to have been a better scholar, and better practitioner and writer than Blundeville, and borrows copiously from Columella and the ancients, often adding ale and spices to their prescriptions. The word *frush* is also used for the frog throughout his work.

He seems to have been more conversant with oxen than with horses; for he says "the horse's age is known by his hoofs and tail, and bars in the roof of his mouth, but chiefly by his teeth;" (at p. 108 he says, "of weary beasts against cold, you must give them things to vomit"), so that he entertained a notion that horses could be vomited. In cattle he seems at home, but he falls off much in his remarks and treatment of horses. Moyle with him is often used for mule. The idea of horses having no brains is found with this writer, who has it "and also they say an horse or a moyle hath no brains, but in the place thereof, he hath, as it were, a bladder filled with wind, and no brains therein or other thing, but like a white water!" this absurdity has been fostered till this day, and used as an excuse for cruel treatment.

That shoeing was formerly more practised by servants and others than at present, would appear from this passage: "The carter ought to have knowledge in shoeing his horse, that when any shoe shall loose by the way in travel, he ought to have hammer and nails ready to fasten it on again, by that means he may save his horse oftentimes from surbat,* gravelling, or pricking with some nail, or cut with some stone, or such like: for to have experience in shoeing, is, a thing soon learned, there is small danger; whereupon among all smiths this proverb is said, which is, before behind, and behind before; meaning, the most dangerous nails to drive in the fore-feet are the two hindmost, and in the hindermost feet the two foremost."

* Surbat is perhaps an old French word, from *surbattre*, to bruise by beating upon, or against, the ground.

Page 135, *cantaradice* for cantharides is first mentioned in this writer, but not exactly as a blister, though euphorbium is directed along with it and oil of bays—it was applied as a plaster.

It is hardly likely that one tenth of the wretched practice and absurdities here recommended, ever were actually used, at least it seems reasonable to believe so, yet I fear the contrary may have been deplorably the case.

The word *ball* occurs first in this writer for horses. Blundeville uniformly calls them pills.

The hydatids in sheep this author seems perfectly aware of, and describes them “like grains of oatmeal living in a bag,” which he recommends the extraction of from the hind part of the head. He observes, it is mostly young sheep that have them, of two years or under, p. 224. A German work has lately assumed this discovery.*

The next English author after Mascal, was Gervase Markham, whose work more pretending to knowledge, is, in reality, more absurd than his predecessors; it went through many editions, the eleventh is before me, printed in the year 1675; that the early editions preceded De Grey, the next writer we shall notice, is clear, because in De Grey's preface Markham's name is mentioned.

The title it bears is, *Markham's Maisterpiece reviced*, &c. This work was published in the reign of Charles the Second, and in this reign the vaunting and puffing style of writing on these subjects arrived at its height, which appeared very much to have arisen out of the practices of the people of the turf, who with their tributaries and dependants assumed great pride and ascendancy in all that respected the horse, keeping at a distance, and deterring by their conduct, any opposition from the more sober and reflecting part of the world. A jockey, therefore, was conceived a most consummate judge, from whose decisions there was no appeal, and few, indeed, dared to call them in question; this spirit descended from them into all the subordinate orders of stable-servants and coachmen, greatly to the annoyance of the public, and of the horses. It is, however, pleasant to observe, that things have taken a more favorable turn in this respect since I have known them; and I hope, ultimately, we shall see all, striving hand in hand, to make these animals comfortable in their respective labors, duly apportioned them, and mankind blessed in their use, which is, however, far from being the case at present.

In writing on these subjects of Horses, I have rarely found it my duty or province to moralize on their abuses, however much it might seem to call for it, but have generally avoided it. If I could, however, by any suggestion lessen the evils com-

* Von dem drehen der Schafe, by Leske. Duodecimo, Leipsic, 1780.

plained of, I would not from fear of any undeserved reprehension withhold my views upon it, for lamentable it is, to see so many thousands of needy people, for such the great mass are, that frequent these assemblies of the race ground, collected and brought together from their families and homes to spend in dissipation the hard-earned pittance they possess, and the spirit of idleness and gambling which it so often leads into, and of forming associations which serve but to strengthen bad habits. Can we also view, without feeling the agony and distress of the animals, urged beyond all natural bounds for a paltry reward to their owner, and to their great and irremediable injury often, I suggest whether it would not be better, or worth the trial at least, to ascertain the speed of any horse through a given space, of no extreme length, by a stop watch, without these heart-rending contentions; and could not there be a fair trial of strength made, or their powers be ascertained by a direct mechanical means, as contending against a given weight, or a spring of ascertained powers, which trial would not be attended with any ill consequences to the animal. Might not chariot-races be again instituted, where the obedience of the animal and accuracy of performance should be his chief praise, and that of his conductor? Could not also single tasks and trials of great skill and management in the wheeling, turning, from rapid to slow, and *vice versa*, and other difficult movements, and the graceful also, be made the subject of a prize, to the winner, which would show to what perfection of obedience and accuracy of carriage he had brought his animal; and might not handsome premiums for beauty, proportion, and shape, in the breeds of horses useful for particular purposes be made the subject of a prize of value, and thus benefit society, under the decision of twelve men picked and good judges, and save in this way such congregations and such excesses and cruelties, hardly allowable in a Christian country. Schools and premiums for accurate driving and management of the horse are much wanting, and would greatly improve the convenience of our streets and ways, none being permitted to drive, but had passed the school of examination, instead of a whip being put into the hand of every awkward boy who is inclined to take it,—but to return to our authors.

This masterpiece, as it is called, is a very verbose performance, and to enter into a critical examination of its contents, would be a waste of time, both of mine and the readers, I shall therefore content myself with but a brief notice of it, as a specimen of the style of this age. It is divided into two books, the first on cures physical; the second on cures chirurgical. The first book is divided into 113 chapters, from the first to the twelfth is consumed in the unintelligible jargon of the day, about elements, temperaments, or temperatures, he scarcely seems to know which. With him the word farrier occurs almost as frequently as horseleach instead of ferrer, which points out the date of the commencement of this corruption of our

language. He seems to have dabbled in human physic, for he has brought not only the logic of it but the diseases also, into the stable: as, tertian and quartan agues, diseases unheard of before in books of this sort, and remedies as absurd, making a masterpiece indeed, of confusion. He also introduces after Blundeville, the diseases of the gall-bladder of the horse, which folly continued, I believe, till the days of Taplin, who I understand, in his early editions had the same disease, but some one giving him a hint that the horse had no gall-bladder, it was dropped in the succeeding editions of his work, which like its present prototype, was pushed by the booksellers through an incredible number of editions, to the exclusion of better works. In the 119th chapter is seen, the word *frog* for the first time among English writers, having been called very properly, as we have noticed before, *frush*, being derived from the French word *fourche*, and from the latin *furca*, alluding to its forked base. He seems nearly or quite unacquainted as yet, with aloes as a purgative, and as he makes no mention at all of diuretics, they were unknown at this period.

I have waded through nearly all our old English authors on these subjects, to see if perchance any casual remark or new idea had escaped them to instruct or amuse, but found nothing to reward my trouble. Markham's book seems to have been a prolific source of profit to the booksellers, and with him ended all views of, or reference to, the ancients in books of this sort; after this period, the public were abundantly supplied, and there was no want either of presumptuous title pages to suit the demand, for it was by many apprehended and believed, that from the race-course, would finally proceed the just knowledge of the horse, and therefore books with large pretensions were the more encouraged.

The next production of the English press worthy of any notice, appears to have been in the year 1651, it is however, the second edition, so that it probably was first printed a few years earlier, it is titled *The Compleat Horseman, and Expert Farrier*, by *Thomas De Grey, Esq.* In his address to the reader at the commencement of this compleat work, he says, "*I do then shew thee what means we have to preserve the Horse from all inward diseases, which I do find to be four, viz. by purge, sweat, phlebotomie, and by vomit!*" His rules for breeding colts are more judicious. The wood *heel* applied to the back of the foot of the horse, I think, is first seen in this writer. His book is in the way of dialogue, or question and answer, with very little method or order. He describes with all the other ancient English writers, a disease they called "*mourning of the chine*," an expression of considerable obscurity; it would however appear, that by the word *chine*, the old writers meant the upper arch of the neck, the disease was the glanders in its last stage of inveteracy, when the discharges were supposed to flow from this part!

The horrid and but too common practice in the present day, of cutting away the substance of the frog, and slashing away the duplicature of the inflexion of the hoof, under pretence of opening the heels, is to be found for the first time in this complete work, the following are his words, p. 420, "*you must observe this rule, viz. you must at what time you would have him shod, cause his hoofs to be pared well, and even, and to open the heels and frush well,*" &c. Of a good purgative for the horse they still understood but little, and made up the deficiency as well as they could by employing very much, glysters and suppositories, the latter is now so little known or used that my reader may be almost ready to ask what this may be. It was a solid roll or mass, made of honey, nitre, and wheat flour, mingled with aniseeds, and other things, and placed in the fundament to dissolve, see p. 436, or an onion cut and jagged, was also used as a suppository.

The aloes for a purgative, as his volume proceeds, gets gradually more and more into use, and at last he orders it almost by itself; and even two ounces of soccotrine aloes for a dose, "*keeping the horse fasting all the day before!*" He still calls horse-balls, pills, that it is probable they were in the habit in those days of making them much smaller than we do at present. The modern blister or something like it, occurs at p. 517, made of "*oil of bay, four ounces, orpin (perhaps orpiment), cantharides, and euphorbium, each two ounces, make them all into fine powder, and set it upon the fire, stirring it till you bring it to an unguent,*" but it is to be applied as a plaster, and bound on. De Grey nowhere speaks of diuretics. When a horse, from the tight lacing of his shoes has become a stumbler, or cripple, for from such cause it arises, he recommends as a remedy, the horrid operation of slitting his nose open and cutting asunder the two tendons that are passing to the lip, and healing it again! which he says "*will give him the use of his legs so perfectly, as that he will seldom or never trip any more.*"

It is likely the art of rowelling or putting a rowel under the skin, came originally from France, as the word *rouelle* signifying a wheel, is the figure of our modern rowel, being a piece of leather of a circular figure, with a large hole cut through its centre and bound round with tow, this expression of De Grey would also seem to confirm it: "*but if the bone be not out then put in a French rowel,*" p. 596. De Grey though a later writer, does not appear from the number of editions published of it, to have been so well received by the public, or at least, pushed by the trade, as the *masterpiece book* of Markham's.

It was towards the middle of the last century (16th), that the Italians began to cultivate and consider the education of the horse, and published several

elaborate works upon it, some of them appear to be of rather an ostentatious character, and from the horrid plates of bits they filled them with, one should suppose they had lost sight pretty much of the mild precepts of that great captain of all horsemen, Xenophon, who asserts, the breaker-in of the horse should prevail by gentleness and not by force, and should rather act the part of the lover than of the tyrant, for nothing can be more cruel than these bits. One of the earliest of these was published by *Frederici Grisoni*, a Neapolitan, about 1560. Another, entitled *La Gloria del Cavallo*, by *Pascal Caraciollo*, in 1586, or rather earlier than this. The French soon followed in this line of study, calling it the *Manège*, and published at Lyons, 1581, *L'Escuier de M. De Pavari, Venetien*. And Germany soon abounded with translations of these, which I saw in great numbers in the public library of Gottingen. Also *De Winter*, a native German work, appeared in their own tongue, as also *Mangen Sautern, Fol. Augsburg*, 1599, and others; extending to Holland. *Pluvinel* published his splendid performance, *Amsterdam*, 1666. A horrid collection of torturing bits graced most of these, as though a most savage and ferocious beast was to be dealt with. And the more learned work of *Peter a Naaldwyck, Liber Phillippicorum sive de Equorum natura, electione, educatione, disciplina, et curatione*, 4to. Leyden, 1631;—not having much cultivated this branch of study, I do not presume to enter into the respective merits of these works on the *Manège*. The Duke of Newcastle's work (Cavendish's), appeared in England about this same period, and *La Guiriniere* and *De Saunier*, in France, and finally, in 1771 appeared *Berenger's* work on the *History and Art of Horsemanship*, containing very just reflections and much interesting matter, which must gratify every enquirer after this branch of the art; Berenger observes, that one Claudio Curtio, an Italian, brought into England by Robert Dudley, Earl of Leicester, published a book on the *Manège*, and was, perhaps, the earliest ever published on that subject in these kingdoms. I early conceived an aversion to the exercises of the *Manège*, from the crippled, dangerous state in which I found the feet of the horses; it reminded me of a man who should be compelled, at all events, to dance a minuet in tight shoes, with a weight upon his back; this feeling determined me never to pursue it more, till their feet were relieved, otherwise the science itself is both useful and pleasant.

In order to enable us to form a sort of parallel of the state of our art on the continent and in England at this period, I take up *De Solleysel, le Parfait Mareschal*, 1754; though the edition before me bears this date, I find by notes made on the books on this subject, in the public library of Gottingen, being a very ample collection of all countries, which I did in the year 1797, that a German translation of Solleysel was made as

early as the year 1677,* whether many alterations had been made in these later editions I know not, as it seems to have been very much used and circulated in all countries, and such improvements might bring it into consideration as a work of the 18th rather than 17th century. It was translated into English, I find, by Sir W. Hope, in the year 1711, which translation I have not seen. The title of the work is repulsive, as being too presumptuous and knowing; it was, however, an error of the time, and a period of bad taste in these affairs altogether, and as much so in England as abroad. Solleysel, however, to render him justice, was a man of strong parts and understanding, and is often very clear and forcible in his language and remarks; the want of arrangement, prolixity, and repetition, are his faults; his operations also, are often most cruel, especially that of unsoleing the foot, which he recommends more strongly than any of his contemporaries or predecessors, and other remedies he mentions are too absurd and filthy to appear in any book. He often gives in the early part of his work, a happy description of a disorder, and then clouds it again by repetitions, obscure and inferior in value; if we might select particular passages, there are some that could not be exceeded in the present day, and he must be acknowledged to have been by far the best writer of his time in this art.

We learn from Solleysel, that the *Meloe majalis*, was used in France for blistering at this period, before the *M. vesicatorius* was used, which was brought from Spain, being found there in greater abundance, so as to supply the increasing demand. He has given good figures of the *M. maialis* by an engraving, and says they were called in France *Maii aviculæ*, or *Little May-birds*; hence we see the Linnean name. This insect is very rare, if at all found in England, and the *vesicatorius*† is also extremely rare with us, but in the South of Europe it is not unfrequent: I have found them in large clusters on the privet bushes, smelling strong like mice confined, so as to be perceived at a considerable distance, and before you got sight of them. Solleysel's directions for the examination of a horse previous to purchase, stands unrivalled; others have but pretended to it: in good hands, however, it might at this day, perhaps, be surpassed. He informs us his occupation was to teach riding to the nobility and others, in which it appears from his own account, and I doubt it not, he had great address. He much praises the Scotch saddle used in those days, flat on the seat and high at the pommel. In shoeing, he strictly forbids the heels to be opened, as the smiths call it, that is, cutting away the inflexions, in which he did well; but all the rest of his orders which follow this, are unfortunately of a most mischievous and cruel description; worse

* Der Warhaftig Volkommene Stallmeister, Genf. 1677.

† Now called *Lytta Vesicatoria*, by modern entomologists.

could not well have been devised for ruining the horse; I forbear even to mention them, that such abuses of these inoffensive creatures should not be revived even in remembrance, hoping the operative smiths never attended to these mistakes. He entertained a most unphilosophical idea also, that too much nourishment went to large feet, and actually proposes the absurd measure of reducing them by a tight shoe, less than the foot, of which shoe and foot he has given a plate; this, he asserts, will bring them into good figure!

The word *charge*, much used by us English, for a strengthening plaster to horses' loins and legs, &c. and whose origin always appeared to me obscure, is derived, I find, from the French; Solleysel says "*Emmiellure rouge communément appellé charge*," which sufficiently points out its origin. From this word *emmieller*, signifying to cover over or coat any thing, is derived probably our expression *coat of mail*, originally written perhaps *coat emmeil*; and the word enamel must have had the same source. The word *emmiellure* would have been much better for English Veterinarians to have used, than the equivocal and indefinite word, *charge*, and as being specific in this sense, I should propose its future adoption*.

After old *La Broue*, he orders a shoe with a wide web, which is a good proposition, but he next orders the heels of it to be thinned outwards to prevent contraction, forgetting that the nailing of the foot would render it nugatory, or nearly so, and such unnatural form of the shoe would occasion a continual strain of the foot against the last nail, which must create more or less uneasiness to the horse, according to the degree of it, and, as the rest of the nails and foot would be perfectly fixed, it could do but little good. He calls this shoe "*For a pantoufle*;" and, like some other adventurers of the present day, orders, if it does not succeed, (which it certainly will not,) to unsole the foot, adding to bad measures a greater enormity of cruelty and ignorance: on much the same grounds has been proposed cutting out the nerves of the leg in this day, after the foot has been ruined by shoeing on a bad principle, instead of changing the principle. He also in cases of contraction, most cruelly orders the posterior parts of the foot to be slit up quite to the pastern, and then to force open the heels, and to heal the parts with wedges of tow pushed between, to prevent their collapse! which would not have been necessary had his shoe been of any value.

In respect to purgatives, his chapter expressly on this subject is obscure and evasive;

* The Greeks, and also the Romans, as we learn from Vegetius, called this useful application *malagma*, a term still preferable to the above French one, for our adoption, and also as admitting an adjective construction, which is ever useful,—as *malagmatous remedies*, *malagmatous applications*, &c. The Greek words, *μαλασσω* and *μαλαπτω*, to soften, is perhaps the root of this word; and *emmiellure* may possibly have been a corruption of *malagma*.

he enumerates a great number, but seems to give the preference to aloes and scammony: this equivocal manner I was surprised at, as, in his first volume, he told us expressly that aloes was the only proper purgative; it was perhaps difficult with him to dismiss the usual prejudices of the day, so that on the continent it appears, they had no consistent notions about purging a horse at this day, as also was the case we have seen in England. The scammony he gave in butter, he says, or grease, five or six drams for a dose. He has assumed a credit in another part of his work for the first introduction of the use of antimony to the horse*. It is painful to observe in the progress of knowledge, how many erroneous reasonings and wanderings there are before the simple truth can be expressed, owing often to the greater facility of writing and of thinking, to the more onerous course of actual experiment and induction, or of watchful and assiduous observation. The cruel use of the cantery recommended throughout this work is appalling; what must these poor animals have suffered in these days! the red hot iron seemed to have been with them a continual resource, where they were ignorant of the nature of the disease, and some of his firings are of a frightful description, such as would make one shudder at the miseries of these poor devoted victims to ignorance, who bear with a singular patience often what is uselessly inflicted in this way, as I myself have often observed with surprise.

Near the conclusion of his book is found a highly curious account of preparing horses for the race course, or *training*, as it is called, gathered in England from some jockey engaged in this line of life at this period. It seems to have been got together with some pains and care, but whether a true account or not I do not undertake to determine, for there is much nonsense in it. It may afford, as it is the only account of the kind I know of, interesting matter, to any one engaged in the cultivation of this department of the art, as to the customs of these times.

This copious volume finally terminates by an abridged account of the art of riding, as taught by himself, evidently drawn up with unusual pains and attention, and I expect is valuable, as he seemed here to have had strong and clear views; he was certainly a forcible writer; I wish I could speak as favorably in Veterinary matters of his judgment and humanity.

In reverting again to our English writers, the next attempt to forward this art in England was by Snape—*The Anatomy of the Horse*, folio 1686. It is accompanied with plates, roughly executed, of the various parts of the Horse; the descriptions are done in a very monotonous, common-place way, and are of little interest. In exhibiting

* The horses have no great thanks to return for this favour, I believe.

the brain of the horse, however, he very properly censures the ignorance of those who would cloak their cruelties by the absurd pretence of his being without any.

A little after this, was published, in the reign of James I., Michael Baret's *Hipponomie*, or *Vineyard of Horsemanship*, containing more learning and mathematical reasoning, than any work of this nature and date.

Snape's work was followed by that of William Gibson, which is better arranged, and in better language than any preceding English writer; I mean the thick quarto, published in 1751, for there are various octavo editions, purporting to be the work of Gibson, of very inferior value. On make, shape, and color, and defects of Horses, to be avoided in purchasing, his descriptions are plain and good; his anatomy has not much to recommend it, being brief, loose, and inaccurate. His remarks on food, and especially what respects grass and turning out, seem to have been the result of much experience, and are sensible and good. In respect to medicine, his prescriptions are of a more innocent cast than those of his predecessors, and consist very much of herbs, syrups, and emollient things; but he appears to have been the first who absurdly added jalap to the aloes, and other useless things; for jalap is certainly not a purgative of the horse, as experiments have since clearly proved; and the aloes is always mild and safe, by itself, or, at least, mixed only with treacle enough to give it a tough consistence, as I myself can attest from very long experience, without a single exception to this remark: the druggists, perhaps, might have recommended to him these additions from motives of interest, against which the younger members in this profession should be on their guard. Peripneumony in horses and pleurisy are well described by him, which gets him into some embarrassment respecting the distinction between it and fever. It is surprising to see what doses of aloes they were in the habit of giving at this period, from one ounce and a half to two ounces at a dose; whereas, we find now six drams to an ounce, an ample dose for almost any horse; whether the aloes is better prepared and purer now, or obtained from a different species of this genus, may be the cause of this, I know not. He describes also an *external pleurisy*, as he calls it, of the muscles of the chest, or, in fact, the intercostals, which is known, he observes, by a horse shrinking from pressure, and showing pain if handled in those parts. I apprehend this intercostal soreness is merely the effect of cold and chills inducing inflammation in those parts, perhaps, from being wetted whilst sweating; bleeding, and fomentations, would probably relieve it. He also confounds it with the imaginary disease called Chest-founder, which is simply a retraction of the muscles of the breast from pains in the feet, which being removed, as I have frequently seen, assume their proper fulness and appearance again. I never saw this disease of external pleurisy or thoracic muscular soreness that he

describes; and one should be distrustful where there is not good evidence, as the imagination in obscure cases can supply much, and we may indeed assert almost any thing about horses, where the proof is difficult. He thinks broken wind may proceed from the chest being too narrow, or from too large a heart and pericardium, or thickness of the mediastinum, or thinness or relaxation of the diaphragm; he also describes the lungs as large and fleshy in this disease*. He recommends Gum Guaiacum in Farcy; it may be useful, perhaps, by its stimulant warmth, and is worth a trial. He describes his balls the size of large walnuts. By plate-vein, he understands the vein of the fore leg, and not the flat of the thigh, as the name *plat* would imply. He does not forbid sublimate, arsenic, and other corrosives to the bone spavin, and firing half an inch deep! and for other enlargements, by which much mischief has been done, instead of gentle stimulants more often applied. His attainments in language, we should suppose, were not very great, when we see *parmacitty* for *spermaceti*, *apiphysis* for *apophysis*, and *aristrochia* for *aristolochia*. His definition of Ring-bone has led into much error, being falsely ascribed to the pastern-bone; this bone, it is true, is sometimes from violence morbidly thickened, and enlarged at bottom, but is then simply an enlarged pastern-bone: the ring-bone occupies the ring of the coronet, and is truly an ossification of the cartilages, arising generally from the fixed and motionless condition to which the hoof is reduced by the shoe and nails†.

He seems to have understood the utility of white vitriol, or sulphat of zinc, in closing old sores, as in Pole evil, &c.; but his application of it is hardly strong enough to do good (see p. 419); and is mixed with other things diluting and opposing its operation; he also goes to blue vitriol, and even corrosive sublimate, for the same purpose, having no settled notion. He appears to have borrowed from Solleysel, and the French, the use of whites of eggs in dressing sores, as a digestive. I remember St. Bel used the same in the commencement of our Veterinary College; but I observed a great objection to its use, even supposing it a good digestive, which I very much doubt, and that was its so soon becoming horribly putrid. In foot-diseases, as contraction, &c. he seems not at all to have understood its cause in the operation of the shoe and nails, by keeping the foot fixed; and he seems also to have originated the absurd notion of running frushes being useful, by carrying off humours; a doctrine for which there is not the least foundation, and has done a good deal of mischief: he orders cutting the

* It having fallen to my lot to discover the cause of broken wind, we know, on the contrary, that the lungs in this disorder are puffy, light, and membranaceous, and that it is a true emphysema, or air extravasated, into their substance.—See Rees' Cyclopædia, Art. "*Broken-wind*," written by myself about fifteen years ago.

† Professor Coleman has strangely followed him in this error, and in respect to the treatment of frushes,

horn of the frog away, and putting urine to it, nonsensically calling it, chamber-lye. Diuretics we find with Gibson, used for the grease, and for frushes: his prescription for it shows a strange ignorance of chemistry and pharmaceutics,—he orders, “Four ounces of rosin, an ounce of sal prunelle, and a drachm of oil of amber, to be mixed in a quart of forge-water, and given to the horse fasting!” This is the first regular attempt at a receipt for a diuretic medicine, that I recollect to have seen. The work concludes with a number of coarse engravings of the different parts of the horse, giving a rude notion of his anatomy and external diseases. This quarto of Gibson was followed, after his death, by swarms of octavos, purporting to be Gibson’s work; but, as far as I remember of them, they were very mutilated representations of it; in which not only the booksellers, but the son of Gibson, I think I have understood, had a hand.

Gibson’s book being much sold, at least the octavos, was followed by a numerous host of works of people but little versed in the subject, as Burdon, Bracken, Merrick, Osmer, Taplin, whose declamatory nonsense went through sixteen editions,* and several others, these pursued one another with uncharitable asperity, and puny criticism;

* It was my purpose, and I had indeed began to form a collection, or catalogue at least, of all writers whatsoever on veterinary subjects; but found in this century so large a share written with no view to science, but merely for sale by the booksellers, that I desisted from pursuing it, as such a general account would only serve to confound and weaken the view of those who really were useful. The importance of this kind of knowledge to mankind becoming every day more fully seen, and the public curiosity awakened, the booksellers took care there should be no want of supply on their parts; and the trash published, almost exceeded that upon any other branch of literature, if I may be allowed the use of that expression for it. The trade did not care so much about the contents of the book, if the title-page was but left to their superior arrangement; and there are at present a class of lofty booksellers, who turn authors as well, or at least by their mercenaries; and, when a work of any real research appears, bring out a spurious scion, and, as we have just said, push it into the hands of an indifferent inquirer as the *only-selling book*, defeating the purposes of the original writer. The celebrated John Hunter, I believe, rather than submit to the revolting terms of such booksellers, sold his own works; being denied by the trade, the consequence was, that it scarcely passed through, useful as it was, a single edition, during the lifetime of the author. I mention it for the use of others, more than for any good I am likely to derive from it; as it may lead the matter to be more considered by the public, and by future writers, that I offered my work on the Foot to several booksellers, rather than sell it myself, knowing the treatment I had to expect, for one hundred guineas; though the experiments alone, independent of writing it, cost me three hundred; but was refused, though it contained more important matter than ever had appeared on the subject of the horse before: and being denied this small pittance, and compelled to print and sell it myself chiefly, it has taken fourteen years to dispose of a small edition of seven hundred and fifty copies, giving nearly a third of them away, that the nature of the work might be seen and known. This I state, that the public should not be unmindful of this abuse of their confidence by these editing class of booksellers; as the reform must, I believe, begin with the public themselves, in being made fully aware of it.

but, in reality, left things much as they found them : some parts of Osmer, however, are exceptions to this remark ; and James Clark, of Edinburgh, is also an exception, having a good deal of good plain sense and sound observation in his writings : and he was supposed by many intelligent persons to have exhausted the subject of shoeing and the foot, yet was he wholly unacquainted with the inflected nature of the horse's hoof, or its bulbs, or frog-band, or the functions and structure of the frog ; nor had he any consistent notions as to the real cause of the contraction of the foot, or any idea of the changed state of the coffin-bone in this disease, nor of the fundamental principles of the foot requiring an elastic shoe ; that he may be said scarcely to have got upon the threshold of the subject. Soon after this appeared the large work of Stubbs, *The Anatomy of the Horse*, 1766, which, for accuracy and excellence of execution, confers a credit on himself and his country : and, though I cannot entirely concur with Professor Camper in his extravagant praise of it, who says, he ought to have " a statue of gold erected to his memory ;" yet, as plates of reference, they will always be highly valuable on account of their accuracy, and will not be very easily surpassed. The human names were put to this work by a surgeon of his acquaintance, and, being followed too servilely where little or no real correspondence in the parts existed, they rather cloud and obscure its value. I saw this author about six months before his death ; he lived in Somerset-street, Portman-square, and complained heavily of the little encouragement he had experienced, even from those who were expending thousands, in one way or other, in their pleasures and sports with these animals. He has left us also many masterly portraits of the best horses of the turf of his day, and of some other animals, young leopards, &c. ; and he also has given us portraits of the horse under the highest excitement of apprehension and terror,—as in a thunder-storm, and at the unexpected approach of a lion, creeping from his covert.

Having pursued and brought down our English Hippiatric history almost to the present time, which I have done, in order to keep in view a connected notice of it separately ; so, in pursuing this general history, I am now led back again to the Continent, in beginning an account of their labours from the commencement of the eighteenth century to the establishment of a Veterinary School at Lyons, and successive schools of this sort on other parts of the Continent, till one of these establishments is founded in England, and shall conclude this history with a brief enumeration of my own feeble labours and researches to promote the laudable views of this institution, for improving the knowledge of these neglected animals, and of ameliorating their condition and treatment.

Before I proceed to the labours of the continent of the eighteenth century, leading to the

establishment of veterinary colleges, I am led to notice an English work of the year 1704, published at the University of Cambridge; like the works of the Ancients on these matters, it is of a mixed character, uniting rustic affairs with the veterinary art; its title is *Geoponica Geoponicorum, sive de re rustica libri viginti, a Petro Needham, M. A. Coll. D. Johannis socio. Cantabr. 1704.* It is an octavo, neatly printed, with a divided page, Greek and Latin. The first page informs us, these pieces were originally collected by *Cassianus Bassus*, for the use of *Constantine*, surnamed *Porphyrogenitus*, one of the last Greek emperors of Constantinople. This work forms a useful addition to the ancient rustic writers; but, excepting a few biographical notices of the early veterinarians of the time of Constantine, of which we have availed ourselves in the early part of this history, it is not of much interest to the Veterinarian. At Copenhagen, in Denmark, whose veterinary school I visited in the year 1797, was published, early in this century, a work entitled *De Philippia Veterum*, by Joseph Erischen, on the attachment and humanity of the Ancients to their horses and cattle, written in good Latin; apparently to encourage men in their kind treatment of these animals. In the year 1733, *La Guiriniere* published at Paris his *Ecole de Cavalerie*, with the diseases, osteology, and surgery of horses. A second edition was printed in 1751. *De Garsault* published a similar work, entitled *Le Nouveau parfait Mareschal*; Paris, 1746: and *De Saurier* published a similar one; Berlin, 1756. *Severini* published his general comparative anatomy,—*Zootomia Democritæ*; Nuremberg, 1745.

The eloquent Buffon next lent his aid to this subject, about the middle of this century; and, though it appears not to have been noticed, was the first who recommended the formation of schools, or veterinary establishments, for the study of horse-knowledge. In writing on the natural history of quadrupeds generally, he is led to dwell largely on the Horse: the historical part is done by himself; the anatomical, by his excellent associate, Daubenton. He drew his materials chiefly from the works of modern travellers, and from the French books of the *Manège*; but does not seem to have dipped much into ancient literature. In his second book he describes the various horses of almost every country of the modern world, in a lively manner, though but few Englishmen would join him in his remarks on make and shape, in which he appears only a copyist of the above writers of the *Manège*. He treats of these animals with no measured step, that it would not suit our views to follow the prolix details of such a work, in which there is much repetition, want of arrangement, and flowery language, more sublime often and speculative than judicious, (so we think, at least,) that we should often say he just inverted the facts. Among other extraordinary, he seems to have apprehended that some horses naturally shed their hoofs, as deer do their horns! It is

certainly true, that through disease the hoofs are sometimes cast off or shed, or through weakness fall off, but that a part so essentially necessary to the existence of the animal, in a state of nature especially, should ever be shed, in the proper sense of the word, is too absurd to imagine; for, incapable of moving, he would become the prey of every animal around him. The succedaneous hoof also, would be of little value, as it would probably be deficient in not possessing the *Keraphylla*, whose inter-necting arrangement binds the hoof to the foot, and holds it firmly on. He also supposes that the horse has five distinct kinds of neighing, and attempts to describe them; and certainly with different feelings and passions his neighings will vary, but to put any fixed number to these modulations of the voice would be impossible, I should apprehend, that could lead to any useful purpose, or be intelligibly established by any description of words. One of those he gives, is certainly nothing more than an expression of extreme suffering and agony.

In the conclusion of his first book he recommends the study of the horse to the physician, who might, he observes, gain both profit and honour by it, and by the study of the whole veterinary art, as it was styled by the ancients; so that we may consider Buffon as one of the first promoters of the express cultivation of this art in modern times, and the establishment of veterinary schools in France took place not long after.

He has a remark on that singular inversion of the hairs on the side of the horse's neck, near the crest, which we in England call *the feather*, describing it as being an omen of great promise; we, on the contrary, in this country, generally consider it a bad indication, though, perhaps, in reality, it is neither one or the other. He says, they call it the Roman sword.*

He afterwards describes the ass, his account of which is much more interesting than that of the horse, if all be true that he relates of him, his peculiarities, habits, and manners, are truly wonderful. Our English asses have not, certainly, the traits he describes, at least in so eminent a degree. On concluding the perusal of this flowery volume, who but must admire the elegant forcible style of the writer, but who is there that in a general way can acquiesce, with real satisfaction, in its doctrines. The history of the ass is followed by that of the ox, sheep, goat, and swine, which are deserving the attention of the veterinarian. He sets out with considering the ass but as a degenerate horse; but, after a deal of verbiage in proof of it, concludes that he is no horse, but an animal *sui generis ab origine*.

Greatly to the honour of this enlightened nation, the first veterinary school was established in France, by royal mandate, at Lyons in 1761, the convent of *Les Deux*

* *L'Épée Romaine*. Histoire Naturelle, tom. 4. p. 279. Ed. Paris, 1753.

*Amis** being appropriated to this purpose, and Bourgelat, a gentleman of Lyons, conversant in horses, was the first appointed professor, opening his course of instructions in 1762; and, four years afterwards, another school was opened near Paris, at Allfort, near the village of Charenton. I have visited both these schools; that of Lyons is most agreeably situated on the right bank of the Soane, within the entrance of the town as you arrive from Paris; attached to the college is a well-cultivated botanic garden, and behind this garden a line of lofty rocks rise, which bound the river on this side for an extent of some miles, and afford most beautiful prospects of the surrounding country; from the summit of these points of the rock, behind this garden, the snowy mountains of Savoy can be distinctly seen, especially, it is observed, a little before rain, when the air appears, from some cause, to be clearer. The snowy peaks of these mountains make a striking contrast to the vineyards and verdant hills immediately before you, nor would you imagine them at so great a distance. I was politely received by the professors of this establishment, and was present at an annual distribution of prizes of books, chiefly brought from Paris, and given to the most deserving pupils, though one, I observed, refused them. This ceremony is carried on in much form, and one of the cloisters of the building is fitted up for the purpose with rows of benches, and a platform or stage is erected at one end for the prefect and officers of the college. The Count de Tournon presided on this occasion, to whom I was introduced by the professors. A noisy military band played during the whole time of this little fête, and many well-dressed ladies and gentlemen of the town and its environs were present, and seemed to take an interest in what was going forward. I left behind me the best gift I had in my power to bestow, in return for their politeness; consisting simply of a box, neatly made, with a horse's hoof, modelled in pasteboard after my own manner, which was much approved, showing the principles of its singular formation. I left also with them a Tablet-shoe, the first that had been introduced into France. Several polite agreeable men were attached to the establishment, but the society of Prof. Bredin and his amiable family gave me most pleasure. In their education they follow, even to servility, the works of Bourgelat, whose praises they largely dwell on, though I think him inferior to Lafosse, and both to Vitet; but there is more of the tact of the practitioner in Lafosse than either of them. The pupils appeared to be pretty numerous and assiduous. There is one part of their education which is omitted in our college, and may be worth noticing, which is,

* A few years since, two coffins were found beside each other in an old part of the building, with no inscription or clue of any kind discovering to whom they belonged, but it was conjectured they contained the bodies of *les Deux Ames* after whom the college was named. This circumstance I had from Prof. Bredin.

that no pupil is suffered to receive his diploma till he can make a horse-shoe, and nail it on; and when we consider that this is not so difficult a thing, as it is learnt by every country booby in a very short time, so it would be, I think, well deserving the attention of our own college, and would, in after-life, render the pupils more independent of their men, as they would be able, on an emergency, to officiate; also, at all times, in case of the practice of physic failing, it would secure them a livelihood.

There is no want of parade and formality in these French schools, which may be necessary to repress the more daring and presumptuous dispositions of this lively people; it seems also, however, to overawe freedom of enquiry, and keeps them from forming opinions not licensed by authority. One of them, I understood, had read my performance on the foot, and ventured, in his answers, to conform to his convictions; but was sent back, without his diploma, to learn his lesson again. Finding that my work was not much circulated among them, on returning to my hotel I determined to offer twenty copies to be given to such of the pupils as had not received prizes that year, for it was said they could not very well purchase it; it was, however, declined by some of the professors, as, they said, there was no precedent for any thing of this kind; I submitted, and left them to do as they pleased; they, however, told me they should be given them after I was gone, and when they had returned from their vacation. In these schools of France not only the horse, but every domesticated animal, and even agriculture, is studied.

Similar establishments succeeded, in Vienna, Berlin, Copenhagen, England, and more recently Stutgard, Wirtemberg, I believe at Naples, and on the borders of Spain, and at Utrecht in Holland. There is an annual *proces verbal* from the French colleges, but, on looking them over, I did not see much to interest, in a professional point of view: they serve to point out to the people those who have attended these institutions, especially, and to declare to their government the assiduity of the professors.

Our own English college was established in the year 1792, under the superintendence of St. Bel, with whom I was intimate, and, in his presence, led in the first horse that ever regularly entered those stables. Vial was his real name, and St. Bel only an assumed one, that when so called, the French did not at first know of whom I was speaking: a village near Lyons, the place of his birth, is called St. Bel, and from it he took this name, as he told me. Having been rather wild in his youth, he was used to say he had many enemies, and he chose to conceal himself from them by this disguise; also this name, as he observed, gave him an air of noble descent, which I heard him, half in earnest and half in jest, once express; and by this name of St. Bel he is exclusively known in this country. In figure he was a tall, stout, bony man, of a very dark swarthy complexion, and prominent cheek-bones; the lower-jaw large,

and dark eyes. His manners were polite, open, and insinuating, but exceedingly jealous and vindictive to any one offending him. He was suspicious to a degree, even of the pupils, and would sometimes listen at the door of their rooms to hear if any thing passed to his disadvantage, and to learn their opinion of him: and on one occasion he procured the dismissal of three or four pupils from the college, from information, there is every reason to believe, so obtained. In his profession he had real practical knowledge as an anatomist of the horse, especially of the bones and muscles; and he had considerable skill, I have understood, in the *manège*, but his physiology and therapeutics were quite of the *antient French school*. His best work is on the death and opening of the celebrated Eclipse horse; he availed himself of this opportunity to make a comparative view of this horse with the ideal medium standard horse of the French schools,* that is, a horse supposed to possess every quality to a certain point, and none pre-eminently; and measured by such a standard, Eclipse must be found strangely different. These differences from the perfect horse, as it was called, were humorously termed defects by the reviewers, but very erroneously, and excited a smile at St. Bel's expense, that a horse so perfect should be so very defective. These differences were in fact the variations of a first-rate race-horse from this ideal standard; and it would appear necessary, for useful comparison, that there should be not one medium standard, but a standard for each particular breed, or purpose, for which the horse is employed, and then the parallel would be both easy and useful. In this work he also entered upon the novel enquiry of the degree of flexion and extension each joint of the horse possessed, measured mathematically, a study not much cultivated since. This volume, which I saw the printing of, was much indebted to the elegant pen of one of the members of the committee, without which it would have been but indifferently suited to an English taste.

St. Bel also published on the subject of shoeing, and went so far as to issue casts, in plaster, of feet, with brass shoes, along with his work, that the subject should be fully understood; but his Treatise, though laboriously pursued, did not throw much light on the subject, from his not being aware of the real structure of the foot, nor of the true cause of contraction, for he believed that these evils could certainly be avoided, if his directions for shoeing were complied with.

St. Bel died in the autumn of the year 1793, of a fever of very remarkable appearance, having boils and buboes in various parts of the body, and Dr. Crawford,† who attended him, observed, that he had never seen in this country any fever that so strongly resembled the plague as this did of poor St. Bel. His interment took place in a vault

* First published by Bourgelat.

† Author of the celebrated Essay on Heat.

in the Lutheran Chapel of the Savoy, and, as I understood, by the wishes of his wife, who was of this communion; and the ceremony, at which I was present, was performed, if I rightly remember, in the German language.

St. Bel's death was severely felt by the young establishment, and some time elapsed before any professor could be found to occupy his situation. At length it was accepted conjointly by William Moorcroft and Edward Coleman; the former, to my great regret, soon after resigned, and the latter, I hardly need say, has retained the situation ever since.

Twenty-five years, and upwards, the College has now been in progress, and it must be admitted, with pain, that the public confidence is not great in respect to the profession, which is felt by many engaged in it; and true it is, that buildings of brick and mortar, however called, cannot confer knowledge; nor, of necessity, men, however titled, placed in them: this invaluable treasure can only flow from individual research and painful perseverance, and we must wait her period; perhaps, when some present delusions have passed away, her course may be more rapid, and her reception more satisfactory. A second veterinary college, somewhere in the North, as in York, or Edinburgh, would, by the powerful influence of rivalry and emulation, keep the other alive, and from setting upon the lees; but, in this case, she would be more efficient, if resting on her own merits, and if Government had no interference with it, farther than erecting a few stables, a house for the master, and a forge, let her then maintain herself; and that she would readily do, if good for any thing, by the numerous avenues to profit, which an establishment of this kind presents, by the livery-keep of the horses, by subscriptions, by fees (not exorbitant ones,) for professional opinion, by the bonus given for education by the pupils, and emoluments arising from the forge, which would together amply maintain a moderately-minded professor, without any grant from parliament, or being burthensome to the public. Carriages and country-houses might not then abound, nor disease, but the duties of the office, and the progress of the art would nothing suffer from these deficiencies: for it is possible, that buildings, especially stipendiary ones, expressly to advance knowledge, may become, from miserable jealousy and low intrigue, the very means of opposing her course, that her sacred path cannot be left too free. Quitting however these considerations, and again pursuing the course of our history, in order to conclude it, I am necessarily brought to some of my own earlier labors, which I shall endeavour simply to give an outline of, though I feel it difficult not to say either too much or too little upon them; in doing which, I would wish to avoid any particular affectation of modesty, equally with any degree of unnecessary ostentation.

The first discovery I shall have to speak of, is the *Broken Wind*.—I believe it was about the year 1794, that the cause of this puzzling complaint occurred, whilst I

was studying at the Veterinary College. I published no account of it for six years after, when, on my return from a two years' visit to the continent in these pursuits, I was solicited by the editors of Dr. Rees' Cyclopædia, to furnish a few articles for their work; and this will be found detailed at some length, under its proper name, *Broken Wind*. It may suffice here just to observe, that the real cause of this much-investigated disease, is at last found to be a true *Emphysema* of the lungs, or extravasated air lodged within the membranes of the cells, occasioning a light puffy appearance, a whiter color, and a crackling under the touch of the fingers. It was probably this more than natural whiteness, and consequently freedom from increased redness, the usual concomitant of disease, that occasioned it so long to be overlooked; for many writers had declared that it could not be in the lungs, they were so perfectly free from disease, and it was a small bladder of air on the outside of the lungs that first attracted my attention to it. For other particulars, I must refer the reader to the original article before mentioned, which, at some future day, I intend to republish, with additional matter.

Next, in respect to the foot of the horse, my labors have been almost unremitted, and blessed with many discoveries, I believe, of no mean importance. The embarrassing cases which continually occurred in my early practice, made me give a primary attention to this organ. It was not till after many disappointments in turning horses out to grass to recover feet, without success, that I began to apprehend that it was the too solid resistance of the shoe and nails to an organ endowed with a high degree of natural elasticity, that produced these injurious effects. To give more certitude to this apprehension, an experiment was necessary of a very tedious description, that of following the same foot with plaster casts for several years, and comparing them, and the evidence obtained was, a constant annual diminution and hardening of the foot, from the too rigid embrace of its protector. After seven years of trial, I began to have engravings made of the feet, and to publish an account of the experiment; and, whilst printing it, was led to examine the hoof more attentively as an elastic organ, and found the whole structure especially subservient to the law of an indefinite yielding to the weight or exertion of the animal, but which most essential principle had been wholly overlooked by the adepts of the shoeing art in their practice. The actual construction, also, of the horse's hoof, was laid open to me in the following manner:—A young fresh hoof had lain on my desk some days, and, tired almost of seeing it, I determined, without any particular object, to make an horizontal section of it, and throw it away; in inspecting it, after sawing it asunder, I observed the loose edges of the frog-band and bulbs, and, tracing them, found them to make one entire unbroken circle round the hoof, to my great surprize, as the hoof's structure then admitted of an easy explanation;

the bars were next seen to be portions only, of the wall, inflected inwards towards the centre of the foot, so that the hoof consisted simply of two circles, one of elastic horn and one of firm horn, instead of several parts, as was before imagined; the sole being merely a supplementary part uniting and filling up these parts, and closing the lower opening of the hoof. Contraction, and the diseases, which were daily taking place in the foot, without our being able to give any just account of them, now admitted of easy explanation. The more elastic the foot, as in blood-horses, the more mischievous the shoe. In fitting removeable shoes to the hoof, I also discovered its cylindrical form, being before supposed to be a cone; next was observed, the obscure cause of horses not being often benefited when turned to grass for contraction, if they had been long shod, viz. that the coffin-bone was partially absorbed during the collapse of the hoof; next the difference between a natural coffin-bone and one that had been shod; and, finally, in the second part, is seen the curious structure of the internal frog, of substrated layers of tendon, with intervening elastic ligament, which before had been considered "*as bags of yellow oil*." The true cause of running frush also occurred, and a successful mode of treating this troublesome complaint. Other works had preceded these, as the History of the *Bots of Horses*, and their highly curious manner of life and propagation; an Essay on the *Gripes of Horses*, its cause, and a successful mode of cure; also, a *new elastic horse-shoe*, which wholly prevents contraction: but, as I find any outline of these researches, however abridged, would be too bulky for addition to this history, I shall content myself with an enumeration below, of the works themselves, none of which, I may safely aver, were ever published, for the mere purpose of the booksellers, but to expose some interesting discovery.

These Works may be had of the Author, No. 7, Taunton Place, Regent's Park; or of the Booksellers, T. and G. UNDERWOOD, Fleet Street; or J. CHAPPELL, Pall Mall.

A TREATISE on the FOOT and SHOEING, in which the obscurities of this Art are explained, and many new parts shewn; a Defect demonstrated in the principle itself of MODERN SHOEING; more mischievous to the Feet than the Abuses complained of; with nine elegant Plates, 4to. price 1l. 1s.; to the above is added, an important Narrative of the Consequences of turning HORSES to GRASS WITHOUT SHOES, in order to remedy contracted Feet. Also, an Essay on the Knowledge of the ANCIENTS respecting SHOEING. Originally published in two Parts.

STEREOPLEA; or, Part III. On the FOOT of the HORSE, concluding the above Work, and is confined to the actual Practice of this Art; and also an efficient Remedy for the evil Effects of the Common Shoe. Price 10s. 6d. with three Plates and numerous Figures. The above are out of print, and scarce.

DIRECTIONS to FARRIERS respecting cutting the FROG, price 6d.

A DESCRIPTION of the STRUCTURE of the HORSE, as it appears by making a

Section through the Body, with the Diseases of the Parts exposed; and also a new account of the Framing or General Composition of the HORSE. Price, with four explanatory Plates, 4to. 10s. 6d. and with a large coloured Figure, price 2l. 2s. 1813.

AN ESSAY on the GRIPEs of HORSES, with an improved and successful Mode of treating this Disorder; the Secret Remedy long used by the AUTHOR in this Complaint, is made public, price 7s. 1816.

A DESCRIPTION of a NEW APPARATUS for CASTING HORSES, when it is necessary to secure them for performing painful Operations, with a Plate, price 2s. 6d. This Invention was rewarded by a Medal from the Society of Arts, Manufactures, and Commerce. 1814.

Also, a Translation of the above Work, on the FOOT; printed at Paris, revised and arranged by the Author, price 10s. 6d. with Plates.

HISTORY of the BOTS of HORSES, and of other Animals. London, 1815. Giving an account of their Species, Habits, and Propagation; correcting some errors of Linnæus, Vallisneri, and Reaumur. Two new Species are added, and some account of the *Skin Flies* of North America; forming a new genus, (*Cuterebra*), since confirmed by Latreille. Two Plates, with numerous Figures, price, coloured 15s.; plain 10s. 6d.

DESCRIPTION of a new-invented HORSE-SHOE, which moves to the impressions of the Foot, with Figures, price 7s. 6d. London, 1824.

The SAND CRACK and QUITTOR. Out of Print. London, 1818.

On the NATURE and CURE of RUNNING FRUSHES and CORNS. Lond. 1813.

On CANKER and RING-BONE. London, 1822.

REFORMED PHARMACOPŒIA for HORSES; containing, a general view of Horse Medicine, a *Materia Dietetica*, *Materia Medica*, and *Pharmacopœia*, with many new and valuable Prescriptions. Second Edition; 7s. 6d. 1824.

Also, shortly will be published,

SOME ACCOUNT of a NEW INSTRUMENT called the CLAVIDUX, for boring the Hoof to any depth for the Nails, by which individuals may shoe their own Horses. With a Plate, price 3s. 6d.

Also, A Disclosure of the best Method of making the Expansion Shoes and putting them on. With five Plates.

A MODEL of the HOOF in Paste-board, which takes to pieces, and exhibits the properties of the Hoof familiarly, with a neat box and description; price 12s.

The ARTICLES communicated to Rees's Cyclopædia, are as follow: — ANATOMY of the HORSE, BITS, BOTS, BLINDNESS, BLISTER, BROKEN WIND, CANKER, CORNS, CURE, COLLAR.

Let me here just notice to the reader, that having begun to publish in quarto, that the horse's foot should be faithfully represented, so I have continued this handsome format ever since, and shall continue it as long as I publish; that any number of my Essays may be bound together at any time, forming a handsome library volume, and will be found nearly, or quite, as cheap as the octavos or duodecimos of the Booksellers; and on re-selling them, I trust, much cheaper.





Published by B. Clark V. Colfax, Jr. as the Act directs.

ORIGINAL REMARKS ON THE GENERAL FRAMING OF THE HORSE.

ILLUSTRATED BY PLATES AND A LARGE SECTIONAL FIGURE.

By B. C. *Second Edition, London, 1842.*

CONCEIVING that a sectional view of the whole horse, if it could be executed, would be a splendid object, and highly instructive for beginners in the veterinary art, and others desirous of a general knowledge of this noble animal, I determined on the trial, and suggested the execution of the drawings to my friend George Kirtland, sen., and with his assistance the section was accomplished by the saw and the knife, and the drawing and engraving of it was made in the year 1808, but more pressing labours on the foot of the horse, and some cross occurrences prevented its being described by me, or published till the year 1813; which edition being now this year, 1842, exhausted, I am induced to renew it with some important additional observations.

Several remarkable circumstances are displayed to advantage by this novel and I believe hitherto (1808) unattempted mode of viewing the animal, as the beautifully varied line and incurvations of the spine, also the extraordinary bend, and incurvation of the *vertebral column* beneath the withers, advancing it over the fore extremities and bringing this part almost to the front parts of the neck, instead of proceeding as a natural external view of the animal would lead us to suppose along the upper part of the withers and neck, is well seen; also the vast length of the *oesophagus*, or gullet, and its passage through the diaphragm into the stomach; also the remarkable and powerful *elastic ligaments* which are supporting the head and neck; the situation and appearance also of the heart, the lungs, liver, stomach, rectum, womb, and the two masses of the brain, are all familiarly exposed in this way, and being engraved upon a large scale, the parts are very distinctly seen, and afford an interesting view of nearly all the internal organization of this most beneficial slave of mankind. The assemblage of so many beautifully formed parts, and the vast diversity of tints also give to the picture a truly rich and unusual appearance.

For certain reasons the division of the body was not made exactly through the centre or middle of the spine or back-bone, but rather on one side, which renders the view more useful, and preserves entire the *Mediastinum*, or *middle curtain*, which separates or divides the chest longitudinally into two chambers, or equal cavities, and which would have been destroyed by such division.

The execution however of this figure was not unattended with difficulties ; and especially the reduction of it to a symmetrical appearance after division, in accomplishing which I have once more with pleasure to acknowledge the assistance of my worthy friend Sydenham Edwards, since deceased, whose name as a natural history draftsman in many departments, will long live in just admiration. He died and was interred in Chelsea, where he chiefly resided.

This description is accompanied occasionally, to relieve the dryness of mere reference, and to give it the more interest and utility, with brief remarks on the physiology of some of the parts, and of their diseases, especially where any new, or more correct view of the matter, seemed to call for it.

That the reader may entertain some notion of the general plan on which this splendid animal appears to have been framed, we shall precede our description with some observations on the circumstance, in laying it down as a sort of general maxim or fundamental truth, that the body of the horse is formed pretty much upon the square, that is his projected side ; and which property, varied as to its direction and extent, will be found to prevail through all the families and various races of the quadruped world ; such variation being suited to the respective habits, and modes of life of each particular family.

This circumstance of the square form of the body of the horse to an artist not yet made acquainted with it as a general rule, may be an interesting fact to observe, and tend much to facilitate his labours in giving the figure truly, and in the subjoined plate will be seen the exemplification of it: the body, legs, and feet being included in this measure, but not the head and neck ; for example, a line let fall anterior to, or touching the breast from the height of the withers to the ground, forms one side of this square ; another drawn parallel to this and touching the extremity of the buttock forms a second line, or side of the square ; and one extending horizontally along the back, touching the withers and rump and uniting the two former, affords a third line, or side of the square ; and the fourth is formed by a line drawn along the ground, touching the lower edge of the hoof, and uniting the two first, is completing the square.

By the observance of this guide as a general law, varying the outline according to the contour of the respective parts, a symmetrical appearance will be ever obtained : on the other hand if this rule is not known or not attended to, and there is much deviation either way, the figure will appear long-legged or otherwise long-backed. Nor was this curious fact unknown in ancient times, as we learn by Hierocles, a writer on veterinary subjects who lived in or about the period of Constantine the Great, who observes, in the preface to his work, in language that appears ironically meant, "that he did not intend to inquire, in treating of the diseases of horses, whether the black colour could be distinguished from the brown ; or whether the side profile of the horse *should be of an oblong or a square form* ; or whether he might have been foaled in Arcas or Cyrene, Hiberia, or Cappadocia, Thessaly, or Mauritania, or Persia." *Ruel, Ser. Græ. Veterin.*, lib. i., p. 4, *Latinè reddita*, fol. ii. His work however, after this flippant display, is little else than an imitation and copy of Absyrus.

Many quadrupeds, which in form are less graceful than the horse, have the square lengthened upwards, such are the elephant, the camelopardalis, the antelope, &c. ; but by far the most numerous tribes of animals are deviating from the square in the opposite direction, as the



CART-HORSE and BLOOD-HORSE in the same Square.

also exhibiting their respective differences.

Published by A. Clark, 45, Abchurch Lane, London.

lion, tiger, bear, dog, &c.; and in a much more extraordinary degree the badger, otter, squirrel, weazel, polecat, &c. and the burrowing and creeping animals.

Having noticed the square which the general outline of the horse describes, we shall now venture upon some remarks on the further composition or framing of his trunk and limbs, which may tend to give clearer notions respecting his construction, and of the intentions of nature and advantages resulting from such arrangements. The spine or back-bone being extended horizontally is forming the basis of the machine; the head and neck terminating it at one extremity, and the sacrum and tail at the other.

The trunk of the horse however, taken alone, and separated from the limbs, appears to be fashioned much after the manner of a boat, within which are disposed the various viscera and organs for the life and support of the machine; and the ribs are serving to enclose them as in these vessels; the boat-like form is obviously best suited to cleave and pass through the surrounding atmosphere with the least resistance, and the machine by narrowing anteriorly gives commodious opportunity for the attachment of the fore-limbs. (See Pl. 3.) The *sternum*, or breast-bone, by its perpendicular direction, sharpness, and depth, (more especially in front) strongly resembles the keel of a vessel, and as having also the property of securing the ribs (See also Frontispiece, No. 45); and it may be a circumstance worthy of remark, that the ancients expressed themselves on equitation figuratively by the terms or epithets relating to navigation—hence their equestrian Neptune, &c.—though perhaps it was not the above circumstance of the figure of the trunk that occasioned this mode of expression; but was probably taken from their first receiving from the Egyptians the managed horse, transported to their coasts on ship-board, and hence also it was that the mountainous coasts of Thessaly became famous for the Centaurs, men mounted on horseback, and made by their fanciful imaginations into one animal. Or it might be from seeing the horse steered by the rein as ships at sea are governed by the helm that led them to this figurative mode of expression. For before the discovery of the rein they might have been considered by them as a sort of indomptable animal, and the idea of a rein did not probably at once occur to them, or that they would be likely to obey it.*

This boat-like frame is decked over, or covered in, by the approaching of the ribs above, and is then closed by the spine or back-bone strongly connecting them; and this spinal column is made to carry the head and neck, whilst the opposite extremity of it, after dilating into the broad sacrum, for the important attachment of the pelvis and hind limbs, is diminished and lost in the pointed termination of the tail, which in some animals, as in the greyhound for instance, becomes indeed a sort of rudder in guiding and stopping the animal in his swift runnings. So that the analogy of the trunk to a boat is verified in more ways than one, and if not in all there appears to be no way of conveying so familiar a notion of these structures as by this resemblance or comparison. The ribs are eighteen in number on each side, and we have to remark, from accidentally detecting it, that the first rib is differently attached to all the others, having an

* Perhaps the Parthians, or Numidians, were the earliest riders of horses, and for this reason, that they simply guided them by a short wand held in their hand and without any rein, which was certainly the most simple way of any, and therefore probably the first.

articulation with the sternum, a singular indication of approach to the clavicular groups of animals.

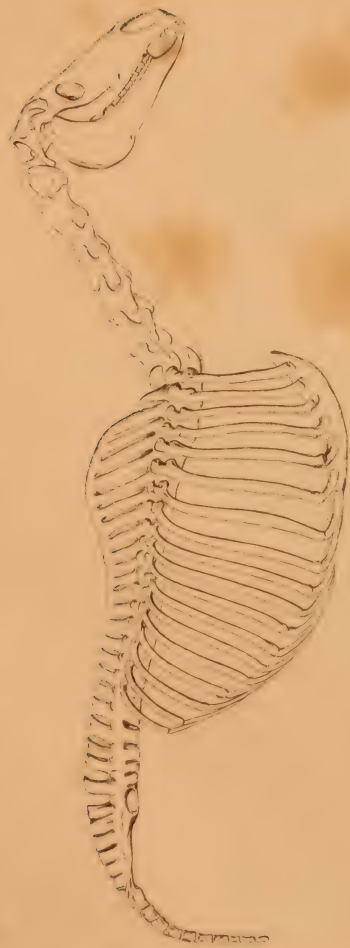
To this frame and suspended to the underside of the back bone are disposed the various viscera, hanging into its cavity; and what is remarkable, *the liver*, the most solid, and weightiest of these, takes its place nearest to the centre of gravity, in the middle region of the cavity, and so falls between the hind and fore limbs; the advantages of its being so placed in the sudden turning round of the body must be obvious, and which has not before we believe been ever noticed, so that it is to the quadruped world it would appear that we must look for the cause and advantages of the peculiar situation of this viscus.

The Stomach, ever varying as to its dimensions and weight, is also placed next to it. Then *the kidneys*, the smallest and lightest of all these viscera, are disposed in that part of the machine where the greatest flexibility is required, viz., about the middle part of the loins. Whilst *the intestines*, large, light, and puffy, are filling up with the *mesentery* the remaining space of the great cavity of the abdomen.

Now the general cavity of the whole entire trunk of the body is seen to be divided into two large unequal chambers or compartments, one forming the cavity of the chest, or *thorax*, and the other the *abdomen*; which are separated from each other by a very stout fleshy curtain called the *diaphragm*, or *midrif*, transversely carried or stretched across this cavity, and is directed from the loins obliquely forwards and downwards to the point of the *sternum*, or breast bone, its middle part white and tendinous, forming a broad disc, or centre, through which passes the *oesophagus*, or gullet; and the direction of this fleshy curtain we may observe, appears to be laid nearly parallel to the lower opening of the abdomen, that is to the great opening which is dependant upon the figure made by the termination of the ribs and false ribs. A third recess is also seen, being a very much smaller compartment, and is provided by the arrangement of the bones of the pelvis, but which is not however a distinct or separate chamber, being part of the great cavity of the abdomen, and this part is called the *cavity of the pelvis*, or *pelvic cavity*. The cavity of the chest also is again subdivided longitudinally, by a process or extension of its membranous lining, called the *pleura*, and which *septum*, or division, is called the *mediastinum*. Both the diaphragm and this are seen interestingly exhibited in the large coloured plate. Also in the frontispiece, plain or coloured.

In further sketching our general view of this exquisite piece of mechanism, we may observe that this boat-like trunk is elevated from the ground on four columns, which are unlike the common pillars of a building, in being bent at large angles in their upper, and more slightly in their lower parts, but are straight near the middle and with joints for permitting the necessary movements.

The fore limbs again are of a different form and character to the hind limbs, which will admit of explanation, by considering their very different offices and the unequal distribution of the weight of the body upon them: the fore limbs being especially formed for receiving and sustaining the greater weight, being nearer to the middle of the body; the hind for impelling the mass forward; as the whole weight of the head, neck, and half of the body is reposing upon the fore limbs, and what is remarkable, and which we may observe on inspecting the coloured



The Vertebral Column & trunk of the *Ecdypus*, Horse

plate is, that the spinal column is tending from both its extremities to form a deep incurvation over the fore legs, and to make there its dip or most depending part, determining consequently the weight towards this point, and these fore limbs therefore by their upright perpendicular position acquire the greatest possible degree of strength for the support of it; and the knee enlarging in the midst, is still augmenting the strength of the column.

It is to be observed, however, that the disposition of the weight, though truly unequal, is not so much so as on a first view it would appear to be, from certain provisions calculated to prevent this. For the horse, if viewed from an elevation, as from a coach-box where his back is seen, will be found to present from head to tail, the figure of a lengthened cone, the point being the head, and the haunches forming the base or widest part of the cone, and being made of stout bone and muscle, are consequently very weighty; so that, although viewed laterally, a much greater share would appear to be reposing on the fore limbs; yet is it of a much thinner and lighter nature than the mass behind: the chest also filled by the lungs, the lightest viscus or material of the whole system, and particularly large in the horse; yet does the head again, placed so far in advance before the body upon the long lever of the neck, give to it a great increase of weight and power over these front parts, tending to burthen the fore legs, and to cause the weight upon these to be much more considerable than upon the hind ones.

We now shall confine our attention to the fore limb itself, observing first the nature of its attachment to the trunk, chiefly by muscle, that being a mode or property the very reverse of the hind extremity or limb, apparently as being designed to afford the greatest elasticity, and yielding to the load: whilst the hind limbs, on the contrary, appear intended to project the mass without any loss of momentum, by having a solid bony union and connection with the trunk by a deep ball and socket joint.

Now the *Scapula* or *blade-bone* of the fore limb in the horse, appears remarkable for its dimensions compared with that of most other animals, and the processes of the dorsal vertebrae forming the withers, are also of unusual length and elevation, to allow ample space for its upper parts to rest against, and affording thereby a peculiarly strong and noble character to the outline of the animal; a construction that appears particularly necessary for receiving the impetus of an animal of such extraordinary weight and powers of action.

In order to comprehend properly the upper portion of this fore limb of the horse, and the names that have been conferred on its different parts, we must resort previously to a close examination of the human scapula, when it will be perceived that no two bones bearing the same name, can well be more dissimilar, as are indeed their uses in the respective animals, from which the greatest confusion of ideas is likely to ensue by an imagined correspondence.

The human scapula, is in fact, an obtuse, somewhat square, or triangular bone, and very short, its angle presented sloping down the back. In the horse, on the contrary, it is a very oblong bone, and comparatively as to its length, narrow; which in birds indeed, is represented by a thin long strip of bone lying along the back. Its surface in the quadruped also, is comparatively smooth and flat, but in the human, considerably tumid and convex, with a corresponding concavity within, and presenting various undulations in its surface, at least in aged bones, and especially those of people who have worked hard in their lives, or have much used their arms.

As the prominent fulness and noble elevation of the human shoulder, is effected chiefly by the acromion and coracoid processes of the scapula, which are directed upwards and supported there by their connexion with the clavicle, giving to the arm a wonderful facility in rotating and swinging about, whereas in the brute, who wants not these motions, it is made a simple machine of support, and of power in the progression of the body, offices of more essential importance to him, we may observe, than are the almost adventitious uses of the human arms, in respect to the human body.

In fact, the horse's bone has no proper acromion or coracoid process; the latter in the human directed upwards, is rising high, and extending itself above and over the joint with the humerus, as the former is also, and may have very well received the name of acromion, or topmost point of the shoulder; but in the horse, this same part is depressed and taking the very lowest point or situation of the bone, having its whole flat superficies above it, going up to the withers and resting against the dorsal processes. And so arranged, the scapula instead of swinging a pensive or pendant arm, is rendered the wide fulcrum and broad basis of the support of the body upon the limb, and its very great length and large surface, afford extensive attachment for muscle, giving it the power of performing these important acts, and for which alone it appears adapted and designed. Now all we can discern of a coracoid, is the appearance of a rounded knob of bone projecting towards the articular cup; and all we can see of an acromion, is the mere thickening of the bone, about the middle of the spine* or ridge of the scapula, and is somewhat curving backwards, which point becomes the vibrating point of action of this bone.

The neck of the horse's scapula also is made further to contribute to these properties, by being of unusual length and flatness.

These bones thus viewed and considered, will leave no great difficulty in the understanding and comparing of them, and of avoiding all mistakes as to the names of their respective parts.

If any one should feel his left shoulder with his right hand, he would perceive the coracoid process to be its summit or highest point, and that the acromion was giving the handsome rotundity and fulness to the posterior of the shoulder, which balanced by the head of the humerus in front, is forming together an arched figure of two equal sides, and without which singular process of the acromion, the shoulder would have made but a flat, mean, and deficient appearance behind; and would have been wanting also in strength and power for some of its numerous displays of action.

In the lighter animals, as the dog and cat, the shoulder blade appears to be more loosely applied to the body, and is standing out considerably from it at top, thereby acquiring greater freedom and extent of action, and where, by the use of the paws in these animals, there is more resemblance to the human hands; for the weight of the body being as almost nothing upon them, such looseness is not much felt.

The horse's shoulder however, I have observed in travelling, stands out at top from the

* Properly signifying a thorn, but used by anatomists for anything thin or sharp.

bones of the withers, and when the horse is standing careless and at his ease, or resting upon one limb; but when trotting out boldly, it becomes compacted and fine: this appears to be done by the elevation of the body by the pectoral or slinging muscles, which by lifting the body upon the limbs, is elevating the withers, and the shoulder thereby becomes in appearance more closely applied to the ribs and more compacted, so that the body when in motion, will be found actually higher than in a state of rest.

The muscles which attach the fore extremities to the trunk, are connected principally with the scapula, and which are spreading in radiating masses over all the adjacent parts of the trunk and neck, and converging to a focus, are inserted, not to the middle, but to the superior parts of the inside of the scapula, binding it strongly to the body; at the same time, not fixing it, but permitting its movements freely along with the limb: it appears also worthy of particular remark, that the two shoulder-blades, viewed in connexion, form by their approximation upwards, a sort of oblong arch, that is together with the arm and limb, and which arch is receiving the trunk placed within it; and the more this trunk gravitates from its own or any incumbent weight, the more these points of the arch will be drawn together, and so be consolidated, and rendered the more compact and stronger, that it would be next to impossible to break down a machine formed on such principles. (See Pl. 3, Fig. 2.) And there appear also other muscles provided at the lower parts of the chest, which passing beneath the trunk, and being attached to the inside of the limbs, suspend, or rather sling the body between them, giving thereby a liberty and freedom of motion not less necessary than strength to all the movements of the machine: these latter, lifting up the trunk at the time of action to the requisite degree of liberty.

The contemplation of the uses of these muscles of the fore limb, and also those of the arm and fore arm of the horse, if our conjectures respecting them are well founded, will throw much light on the structure and intentions of the same parts in the human anatomy; for very much the same parts exist in both, the horse being only deficient in the muscle of the clavicle, and possessing all the others found in the human arm. For nature grandly simple and tenacious of her plan, extends it through all her animals, modifying it variously however, but not departing from it even in the human structure; the human arms, for example, pendant on the sides, perform very various offices, often more noble it is true, but certainly in one sense, of much less importance than in the brute, where they are the necessary agents of his support and progression; that what they perform in the human structure, compared with these, may be considered as of a secondary or almost adventitious nature: so that in the brute must be sought their primary uses and intentions, and the causes of their form and place; and in this way, more just views we apprehend will be furnished concerning them; at least we venture to suggest it as a matter for the consideration of more able anatomists.

The next member of the limb to the scapula, is *The Arm*, which compared to the human, is very short, and so covered by muscle, that it is generally overlooked, and the fore arm mistaken for it, not extending transversely beyond the outline of the limb. Might we venture to attempt to explain the manner of its use, which we do with a view more to excite others to consider it, than as a solution of its difficulties; we should first observe, that it is disposed

obliquely between the upright column of the limb and the lower advancing point of the *scapula*, and against which it is abutting, and would push it by the application of any force below, or on the foot acting against the ground, in a direction upwards and forwards, but being restrained and held in its situation by the strong muscles connected with it, it becomes opposed to this operation and firmly presents a broad surface or base to receive the impression; the perpendicular although indeed flexible column of the limb, being so disposed beneath it as to fall in a line opposite to the angle which the front and base line of the *scapula* make in meeting at the top of the shoulder, thereby obtaining for it the most extensive surface of support it can be made to afford.

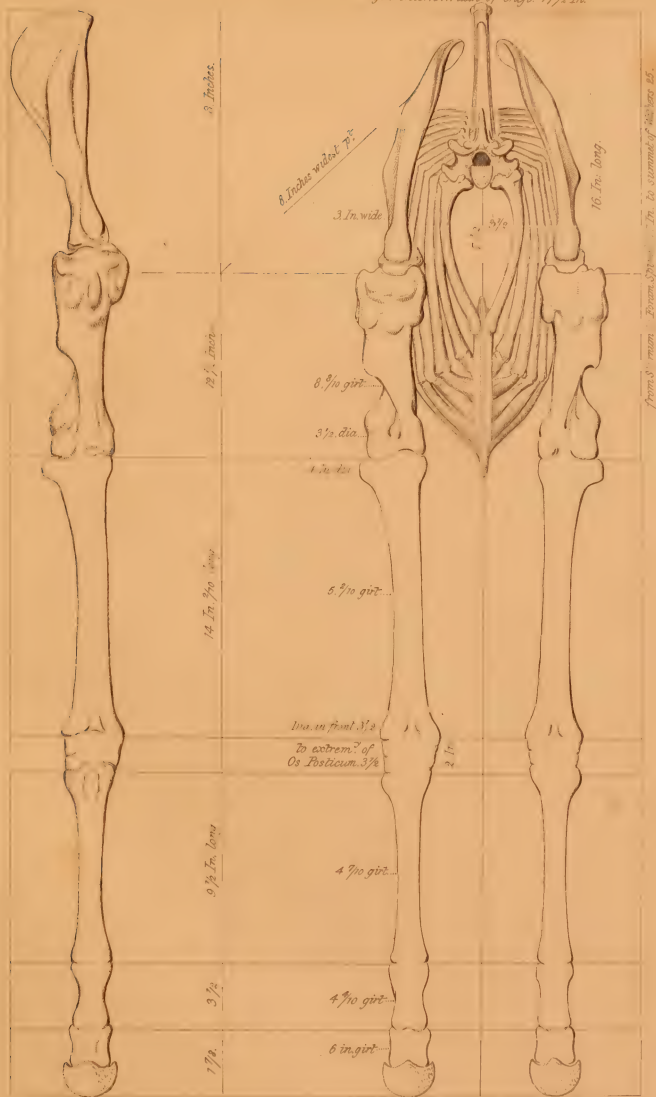
Now the Arm bone or *Humerus* next, being held as it were in equilibrio between the upright part of the limb and the *scapula*, becomes as an oblique librating beam, and the chiefest power in giving play to the limb, the obliquity of this bone being maintained, and the collapse of its angles prevented, which it makes with the *scapula*, by the peculiarly stout muscles which are passing round the front of the joint; whilst others at the opposite end of this bone, appear disposed to prevent a collapse of the angle which it is making with the upright column of the limb, which column appears to be situated in a state of rest beneath the middle line of the breadth of the *scapula*. And proceeding from the *humerus*, and attached to the olecranon, or elbow, (which in the horse is constituted a fixed and firm part of the radius) and filling the great triangular space between these two bones, are five strong deltoid muscles, which prevent a collapse of the fore arm with the *humerus*, and when in action, these are forcing the body forwards upon the limb previously advanced and fixed on the ground.

The *Fore Arm* succeeds below, and is situated as we have said, almost perpendicularly beneath, and while it strongly supports, is extending the limb and elevating the body; and round whose head or upper part, are assembled the muscles whose tendons go to the knee and foot.

The *Shank* presenting almost a naked perpendicular column of bone, and much shorter than the preceding, is farther contributing to extend the limb and to afford the power of deployment, and terminates by meeting the pastern bone and forming with it the fetlock-joint, making there a pliant angle, upon which part of the weight and impression is dissipated, the rest with diminished rigour being carried obliquely forward towards the foot, for it must appear evident, that if the foot had been situated directly under the perpendicular line of the limb, the weight would have been much more severely felt and oppressive, still none of the weight can in reality be lost.

Finally occurs the *Basis or Foot*, possessing a remarkable elasticity for destroying the effects of the impression of the weight, and also with an insensible covering of horn for the contact and abrasion of the soil. Its plan, if we may be allowed the expression, appears to be, that placed before the limb, it should receive near its front parts, the obliquely advancing pastern and coronet-bones from the fetlock joint yielding to the weight; and that then the hoof, by taking a reclining direction backwards, should convey the impression or weight backwards again towards the posterior parts of the foot, where its elasticity and spring principally reside, by means of the furch and the double indlexures of the hoof, thus prevent-

Extreme length from 1st to last rib. 31.5 In.
 grst intern. Width of Chest. 17 1/2 In.



From S. man. From 27th In. to summit of withers 45.

ing any direct reaction to the fetlock or concussion to the trunk, and affording ease and liberty to all the various parts of the foot as to the body: and which is in conformity also with the general design of the fore limb and its attachments in easing the weight of the body, and in softening the impression of the stroke; the fore foot therefore, as we have remarked, is very differently constituted to the hind, in possessing more elasticity and extent of bearing on the ground, a wider sole, and a larger, thinner, and less upright hoof, which will enable us satisfactorily to account for the more injurious effects of the iron shoe upon it, than upon the hind foot; and not, as has been hitherto erroneously supposed, from the hind feet being more exposed to the dung and urine of the standing of the stall.

The hoof of the horse having been an object of our particular solicitude and attention, we here advance the most improved views we have been brought to respecting it:—

The hoof of the horse, is most admirably constructed of a cylindrical circle of horn, gradually diminishing in height from the front, the circle interrupted and broken at its posterior part, with the ends or extremities inflected or turned inwards towards the centre of the circle, thereby creating a triangular open space or cavity for the insertion of the *furch* or *frog*, which is everywhere attached to the upper edges of these inflexions, and like the bow-string to the bow, the furch is made of a softer and more elastic horn, yielding readily to the bow-like actions or movements of the wall of the hoof, its true and real office: for the furch is not performing, as has been heretofore strangely imagined, the operation of a wedge, in forcing asunder the inflexions, but is almost wholly passive, receiving their impression and dilating laterally in concurrence with them through their whole course, for the contrary, it is clear, would have been the very inversion of good mechanics, or as the using a softer to rend a harder body; or the employing a wedge of dough to cleave a block of wood.

The wall of the hoof formed entire in front, presents a more solid and stronger resistance to the ground, than does the hoof of any other animal, but is possessed of certain elastic provisions, by which the liberty of all its parts is maintained, and the horn being of an extraordinary tough nature and insensibility to the soil, and being provided with an unceasing power of restoration by growth, it completes the limb.

We hope these suggestions respecting the nature and properties of the foot, may lead to much more enlightened views and practices as to its treatment, and subvert the present baneful measures in the defending it.*

The Hind limbs situated almost at the other extremity of the body, have a less load upon them, and less occasion therefore for the perpendicular line of support, but are bent into vastly more acute angles, and being thrown into a general backward direction, they obtain the necessary impetus for the projection of the body, especially during very accelerated movements, we therefore may distinguish these as the *Propellers* of the machine, and the fore legs as the *Supporters* of it.

* The reader is referred for a more extended account of this beautiful organ, to the *Hipponomia*, Second Edition, 1829; and of its destruction by common shoeing, to the *Podophora*, with twelve elegant plates of new objects.

It is by the angles of the fore limbs deploying, and of the hind limbs closing under the body and fixing on the ground, and then returning again to a state of extension, that the body is forced forward, and that nothing of the momentum should be lost, these hind limbs possess a solid bony connexion with the pelvis, by ball and socket joints, as was formerly stated.

And it is to be remarked, that the *Ilium* or *Haunch Bone*, widely branching out in these limbs, appears to hold a sort of correspondence, but reversed and opposed to the situation of the shoulder blade in the fore extremity, and is actually a separate piece from the pelvis, from which it can readily be detached by the scalpel, being held to it by ligament only. Though it will not materially affect the view we are taking of it, whether it be considered as part of the limb, or as part of the main trunk, or as common to both.—This widely branching bone allows of vast surface for the attachment of the immense muscles which project the body; and with its two coadjutors, the *ischium* and *pubis*, which are all three meeting in one point to form the socket or *acetabulum*, for the reception of the head of the femur, or thigh bone, making together a ball and socket joint of great strength, from whence the two bony columns of the hind limbs, proceeding to the ground in a direction nearly parallel, not converging as do the fore limbs, their forces are thus more powerfully directed upon the mass they have to remove, or transport, the frame of the pelvis, first receiving their impression and conveying it to the trunk and rest of the body.

The *Femur* or *Thigh-bone* being articulated nearly at the same height or level as the point of libration of the scapula, which is somewhat higher than its middle, so this bone very similarly situated as to height, is placed between the *Ilium* and column of the limb, as the arm is in the fore extremity, but reversed in its direction, advancing forwards to the stifle, as that does backwards to the elbow (See Pl. 5): it is describing however in its range of action, a much greater portion of a circle, passing in strong movement, even considerably behind a perpendicular line falling from the acetabulum to the ground, and going to a very great extent forwards, thus powerfully projecting forward the mass of the body.

The *Tibia* or *real leg-bone*, next succeeds, and is projected backwards; and next, the bones of the *hock* or *tarsus*, and to these succeed the *metatarsus* or shank, and then the two bones going to the foot, as in the fore extremity. The hoof however, presents a slight difference, in being harder, narrower, and more perpendicular or upright, in conformity with the impelling powers and hardness of the rest of the limb.

I was led to observe in frequently dissecting this hind limb at the Veterinary College in the years 1791 and 2, a singular variation of structure in the horse from the smaller animals, which seems worth recording here. It is this, that the horse appears to be driven forwards almost by the limbs alone and their muscles, whilst the dog and cat and other of the smaller animals, which in comparative swiftness exceed the larger, effect their speed more by the muscles of the back, some of which are inserted into the inside of the ilium in rather an extraordinary way, and are acting there with great power upon the line of the spine, and bending it like a bow and shooting the body forwards; this circumstance appears to have been overlooked by Douglas in the *Myologia Comparata*, though written expressly on the anatomy of the dog: in the horse, on the contrary, this part of the ilium is occupied by the muscles of the thigh, and





it is perhaps the rigidity arising from the magnitude of the spine in the larger animals, that has rendered this principle incompatible or inconvenient to be applied with them, and may be the cause of its not being pursued. In observing the hind legs of any animal, it may be presumed, with tolerable certainty, whether speed or strength was intended to prevail, and in what degree, by the acuteness of their angles and the length of the limb: thus the hind limb of the elephant and camel is nearly a straight column; whilst the leg of the dog is crooked to a proverb.

A limb when detached from the trunk with its apparatus of muscles about it, makes the appearance of a very lengthened cone or pyramid, whose point being inverted, is made to meet the ground, and its broad basis to connect it to the body and give it play.

Having noticed separately the fore and hind limbs, we now take a view of them in combination, in order to remark a very beautiful provision in their arrangement: and we ought also to state, that this fact was not of our own observing, but was communicated to us several years back by St. Bel, the first professor of the Veterinary College, and was probably not unknown to the veterinary schools of France. It is this, that the bones of the two limbs of quadrupeds are contra-disposed in the angles of their upper parts, sustaining by this means the body reposing between them; the shoulder-blade, for example, is placed inclining backwards or towards the loins; the haunch-bone, on the contrary, is inclining forwards towards the shoulder, opposed to it, and directed somewhat after the manner of two rafters in the covering of a roof: but their distance is so considerable in this animal, that the fact might easily escape notice: the two bones below these, the arm and thigh-bone, are in like manner opposed, the thigh-bone passing obliquely forwards to the stifle, the arm backwards to the elbow; the tibia again is directed backwards to the hock, and the *cubitus*, or fore arm, though nearly perpendicular, is found a little advancing forwards in the opposite direction; the remainder of the limb to the fetlock, is made a simple perpendicular column (see fig. 5): it is obvious by this arrangement in the angles of the limbs so contra-disposed or opposed to each other, that the trunk, which reposes between them, will be supported and held up, if the open state of these angles is maintained; for it will appear evident, that if these angles had all of them been formed in the same direction in both limbs, the animal must have inclined and fallen backwards or forwards, as the disposition might happen to be.

These arrangements may be very well observed on the living animal, but still better as also some other parts of these observations by a view of the skeleton: to maintain their opposing forces, and prevent the collapse of these angles, will be found perhaps one of the most important uses of the muscles of these extremities, though hitherto but little attended to.

Having viewed the outline of the frame of the body, also the trunk and the limbs separately and combined, and interspersed several detached remarks made at various times during our studies formerly, and by some additions brought them into something like a methodical arrangement where none before existed, so we hope they may serve as an imperfect beginning or basis for receiving more fully digested views, and stimulate others to the farther prosecution of the subject. We now conclude our labours in this way, with one remark more respecting the moving powers of the limbs, and their distribution to effect the great object of progression, which has appeared to us not to be merely obtained by the flexor and extensor

muscles, but is contributed to, if not chiefly caused, in several instances at least, by what have been called the abductor and adductor muscles: for it may be seen on examination, that in the upper parts of the extremities a four-fold position of the muscles is provided, being placed before, behind, and on either side the limb, the two former bending and extending the limb directly, have been called the *extensors* and *flexors*, those on the sides drawing the bone to the outside or inside, according to their situation, considered singly, have been called *abductors* and *adductors*, or, as they bring the limb towards or carry it from the body; these latter, we believe, can be made essentially to co-operate in the progression of the animal, in the following manner, viz. by contracting or acting at the same moment of time on both sides the limb, which, if with nearly equal forces, the bone will not in this case be drawn in either of those directions, but will be compelled to take a course in the diagonal, or at right angles to these, in the direction of the flexors and extensors, with great power, describing a somewhat similar line that a stick would, placed against a wall at one end and drawn by two cords at the other with nearly equal force, it would not long remain stationary, but pass in a perpendicular line between the two opposing cords, and describe a portion of a circle perpendicularly between them; in this, or some similar way, these muscles could be of constant use, otherwise the largest and most powerful muscles in both extremities would appear to be almost idle masses of flesh, and truly idle offices have been assigned them, as turning out the limb a little, or inwards a little, or grasping bodies, for which the animal can have no occasion, steadying the body, &c., conclusions drawn from insulated views only, and such offices would be truly unimportant, if not wholly useless, in these animals: we leave these remarks however, for a more digested consideration; and now proceed to notice the numerous objects presented to us in the sectional exhibition of this interesting animal.

Plate 4, figure 2, is showing how the body is supported by suspension between the two upright columns of the fore legs, by an arch formed by the approach of the shoulder blades, which in more weighty and therefore slower animals, are nearly perpendicular, and not so reclining backwards as in the horse. In order to record their dimensions, we may observe, these limbs were sketched by the actual admeasurement of the bones of the skeleton of the celebrated ECLIPSE horse, now in my possession, that a comparison might be made at any future period with this noted race horse. The skeleton, I may inform the reader, is a natural one, and the bones cleared from every thing but the ligaments of the joints which hold the bones together. These dimensions were taken by a flat two-foot rule placed parallel to or by the side of the limb, and the intersecting lines were drawn as nearly as possible through the middle of the openings of the joints. The girts also, or circumferential measures, were made with a piece of tape of about $\frac{3}{8}$ of an inch wide. This figure on a larger scale, was done by Edwards after accurate admeasurements; he mistook however in all his drawings the top of the horse's shoulder for the acromion, deceived probably by the name. In the first edition these drawings were mislaid and could not be found, and under the pressure of the moment, as good a figure as the wood engraver could give me was used instead; afterwards the original drawings being found, I had them reduced by a scale, and engraved.

REFERENCES TO THE FIGURE.

THE HEAD OF THE HORSE, compared with most other quadrupeds, is remarkable for its length and dimensions, formed by an increased size of the cavities of the face, and by the extraordinary elongation and width of the jaws. The actual cavity containing the brain, not occupying more than perhaps a sixteenth or a twentieth part of the entire head, the rest being made up of cavities of thin bone; and there is no prominence or overhanging of the os frontis or its cells in the horse. The eye is sufficiently prominent on the side for him to see before, and also behind him, and quick, full, and globular, gives great animation to the countenance; and when under agreeable excitement, his dilated nostril, broad full lips, and capacious mouth, impart a peculiar vigour and strength of expression, and with a noble generosity of disposition to forgive injuries, that surpasses perhaps every other animal.

PARTS OF THE HEAD, Fig. 1.—The *Septum*, or longitudinal cartilaginous division of the nose, covered by the Schneiderian or olfactory membrane; it is the seat of catarrhs or colds, various farcy-gleets and ulcerations, and of the true glanders. The blood-vessels are seen ramifying on its surface, enlarged from inflammation and disease. The lower part of the *Septum* is perfectly white, the cartilage being destitute of its membranous covering abraded by the saw. 2. The *Nasal Bones*. 3. The *Palatine Bones*. 4. The *Inter-Maxillary Bone* holding the upper incisor teeth. 5. The *Symphysis* of the lower jaw early in life obliterated and forming the lower jaw into one bone. 6. The *Tongue*. 7. The white dense membrane covering the palate, the lower half of double thickness, forming transverse bars, and is the seat of the *lampers*, where it rests against and falls below the upper incisor teeth; beyond this the six grinder teeth at the farther side of the mouth are also visible. 8. The *Os Frontis* and its cavities. 9. The *Parietal Bone*. 10. The basillary process of the *Occipital Bone*. 11. The *Sphenoidal Bone*, forming with the occiput the basis of the skull. 12. The *Ethmoidal* and its cells. 13. The *Cerebrum*, or greater brain, with its alternate layers of medullary or white, and cineritious or darker matter. 14. The *Cerebellum*, or lesser brain, with its white arborescence or *arbor vite*, from which proceeds the spinal chord. 15. The *Plexus Choroides*, is the red near it; *Corpus Callosum*; and the white bulb near it, the *Corpora Quadrigemina*: all these parts may be best seen in a section as large as life, of the horse's head, done by G. Kirtland about the year 1806, with the parts of the throat also in section. 16. Is a remarkable mucous gland lying behind an eminence of bone, called in the human *Sella Turcica*; it is called the *Pineal gland*, also the *Crus Cerebri*.

OF THE FAUCES.—The nostril in quadrupeds generally terminates the face downwards, the mouth being situated behind it, and the lips are here performing the double office of lips and fingers, to which last in section these have a strong resemblance. 17. A capacious opening continued from the left nostril, and passing over the bones of the palate, is seen the chief organ for the admission of air to the lungs. 18. A remarkable convex valve, formed of cartilage, closing the opening of the *Tuba Eustachiana* or *Eustachian Trumpet*, or passage leading to the ear; for a particular description of this part, see Plate II of the Section of the head above referred to. 19. The *Velum Palati*, without a distinct *Uvula* in the horse. 20. The great cavity of the *Fauces*, leading into 21, the passage of the *Œsophagus* or *Gullet*, lined throughout with a thick white membrane or cuticle, loosely adhering to the canal or

muscular pipe, and in the ruminants wholly covering the maw, or first stomach, and in the horse extending over a considerable portion of the upper part of the stomach; the Oesophagus enlarges near the stomach and becomes paler.

OF THE AIR PASSAGES.—These parts have been attempted here to be introduced entire, having been represented in section in the Plates of the head by Mr. Kirtland, above referred to. 24. Is the Atlantal cornu of the *Thyroid Cartilage*, being part of the *Larynx*, or valvigerent head of the windpipe. 25. The *Epiglottis*, or *Valve*, which shuts down during deglutition, preventing the food from passing into the windpipe or trachea. 26. The short limb of the *Os Hyoides*. 27. The convex reflexed edge or lip of the *Artenoid Cartilage*. 28. The same covered with muscle. 29. The *Cricoid Cartilage*. 30. The beginning of the *Trachea*, or *Wind-Pipe*: this part is very frequently absolutely crushed, and more or less injured, by rough hands squeezing and pinching it under the pretence of ascertaining broken wind, of which it appears to be an uncertain criterion; or at least but in the last stage of it, when other symptoms and an attention to the nostrils and flanks are more sure guides. Two fine horses I have seen destroyed by this gross practice, and others with difficulty of breathing, which has never been recovered from, the membrane lining the pipe being dislodged by the gripe and stopping the passage has created suffocation. See article *Broken Wind* in Rees's Cyclopaedia, and since published separately. 31. The *Cartilaginous Rings of the Trachea*, about sixty in number, posteriorly broken and thinner at the lower part of the pipe where it enters the chest, they are converted into oblong thin elastic plates, at least at the back part of the trachea, and tiled one over another, for permitting perhaps the contraction or collapse of the canal to the quantity of air required by the lungs. This canal is smallest about its middle, gradually dilating to either extremity.

OF THE SPINE, OR BACK BONE.—The irregular curving line described by the spine is truly remarkable and worthy attention, and is exposed advantageously by this sectional view: it appears to be inclining downwards in both directions from its two extremities to form a curve at its lowest part over the fore limbs, and determining as it were, the weight upon these two upright pillars of support; the dorsal processes which we call the withers, are of prodigious length in the horse, filling up and strengthening this otherwise externally hollow part; the extreme points of these bones serve also to form the prominent outline of the withers, a part nobly characteristic in its contour of this race of animals: the extraordinary length of these bones also most usefully serve to fit them for the application of the long and large elastic ligaments supporting the neck and head, larger perhaps proportionably than in almost any other animal, and further advanced before the body; these are attached to the second vertebra chiefly, leaving the atlas quite free; and they afford also a lodgment for the muscles to sustain and move these parts, as also a rest for the shoulder-blades. Along the back and loins, the spine is gently raised into an arch upwards, useful in opposing the weight of the suspended viscera in the cavity of the abdomen, and in bearing burthens externally brought upon the back; forwards, it is carried in its passage almost to the front parts of the neck, where, from an external view of the animal, the eye would certainly not be led to suspect it, ascending rapidly to the head from the fore legs: the Camel being deficient in these processes of the withers, the hollow wavering neck makes this construction much more obvious externally: and a second and lesser arch of the spine is formed at the sacrum, being somewhat raised above and also convex below, affording superior width and a firmer support thereby, for the powerful operations required by the hind limbs in projecting the body.

In respect to the individual members or pieces composing this bony column, their particularization is not necessary; its leading divisions we shall however notice, beginning at the head.

The first vertebra, 32, bears the name of *Atlas* in the human skeleton, from its supporting the globe of the head; but in the horse and other quadrupeds it may be said to suspend rather than support it, so that the same name will but indifferently apply. 33. Is the second cervical vertebra, and called in the human *Dentator*, having angular or tooth-like projections: it is of remarkable length in the horse, with a lofty longitudinal crest on its back serving for the strong attachment of the cervical ligaments, a detached portion of which, passing over the atlas, is sent to be inserted in the occiput. 34. Seven are the number of the cervical vertebrae, which number, according to that excellent observer John Hunter, obtains in nearly or quite all the families of known quadrupeds, whether long or short necked. Between the articulations or joints of these vertebrae, there is interposed an elastic cartilage, expanding when there is a remission of pressure upon the column of these bones. 38. The first *Dorsal Vertebra* and commencement of the withers. 39. The last *Dorsal Vertebra*: their number varies, there being usually eighteen in the horse, sometimes nineteen. 40. The last of the *Lumbar Vertebrae*; and over this there appears a remarkable space between two of the *Dorsal Apophyses*, or upright processes of the vertebrae, which space is occupied only with ligament, or the muscles of the back, and appears given to afford opportunity for the greater flexibility of this part of the spine in turning; and in the lateral movements, it is to be remarked also, that the superior branch of the ilium, or haunch bone, is disposed opposite this opening, that strength should not be wanting, and to prevent the danger of a dislocation from too violent or sudden lateral distortion. 41. The *Os Sacrum*. 42. The *Os Coccygis*, and *bones of the tail*, diminishing to the extremity, and solid, terminate the column. The ass's tail is said to have two more bones than the horse's.

We ought not to pass over without noticing it a knob or callous of bone growing to the under-side of the lumbar vertebrae, and situated opposite the articulation or joint, which formation has been the effect of excessive labour, or over proportioned loads to the powers of the animal, inflaming and disordering these bones, and causing them to coalesce by ossific deposit, creating much pain and suffering to the animal. Some horses appear lame behind from these ossifications; being in the neighbourhood of the kidneys, others have a difficulty in staling; others in backing with their load appear to suffer excruciating pain; and some cannot be made even to attempt it by the severest usage: it may also be observed on careful inspection, that four or five of the dorsal vertebrae, are in a similar manner knit together by bony deposit, and the joints or separations in these are obliterated from the same causes probably. The mare, the subject of this representation, was one of the horses of the Dunstable stage, and was brought to the slaughter-house dead, having very suddenly died, and as was apprehended from being over-driven.

The *Spinal Marrow*, or *Cord*, a continuation of the white parts of the brain, is seen loosely lodged in its canal in the upper parts of the bodies of the vertebrae, sending off branches of nerves to all the parts it is passing through, in its long course; and this spinal cord has been lately detected as having a hollow canal through its centre, by Mr. Sewell.

OF THE UPPER PARTS OF THE NECK.—Between the processes of the withers and the cervical vertebrae, is a large deep triangular space, filled up chiefly by muscle, but having in the middle longitudinally a ligament of extraordinary strength and elasticity, forming upwards the *Crest*; it is of a yellowish white colour, and divided into several portions, through which are seen the red fibres of the muscles of the neck; a separated and very distinct flattened cord of this ligament is seen extending from the extreme point of the processes of the withers to the back of the head, 43, inserted strongly into the *occipital bone*. It may be useful to observe, that it is these ligaments when over distended, or

injured by blows near their insertion, that lead to the disease called *Pole Evil*. And these ligaments, as we have formerly stated, being in a high degree elastic, appear to be the cause of that singular appearance in the dying horse of the head being drawn backward; for the weight of the head being removed, the horse at this time usually lying on his side and all muscular exertion ceasing, these ligaments uncontrolled powerfully pull the head towards the withers backwards, and with such force as often to create considerable surprise. Above these ligaments is a mass of fatty cuticular matter, which becomes distended by high feeding, and makes the crest full and hard to the feel of the hand, and also carries and maintains his noble mane. This part with us was anciently called *the Chine*, and was derived perhaps originally from the Greek word for the neck, *αυχνη*, *aucheen*. Hence we have it in old farriery books the "*mourning of the Chine*," that is, farcy discharges from the nose were most ignorantly supposed to proceed from this part. It is liable also by neglect to a disease called *mange*, especially in the coarser bred horses, which may be readily got rid of by the assiduous application of soap and the water-brush; and in very inveterate cases, the use of a mild red precipitate ointment may be required. This term *mange*, we get without doubt from the French *demangeaison*, signifying the *Itch*.

OF THE THORAX.—This cavity is posteriorly bounded by the *Diaphragm*, or in common language the *Midriff*, which like a curtain, obliquely separates it from the abdomen; in its circumference muscular, in its centre tendinous, which this section exhibits in an interesting manner. This muscle is greatly concerned in respiration, and is the chief cause of the heaving and agitations of the flanks in broken wind, and other complaints affecting the lungs or intestines, affording often a useful means of judging of danger and of the approaches of death in these animals. The great trunk of the *Aorta*, or chief artery, is seen passing through it near its insertion into the loins, and below this is seen the *Œsophagus* or *Gullet* also passing through it to go to the stomach. Anteriorly the cavity of the chest is maintained and supported by the *Sternum* or *Breast-bone*, 45; its deep or wide surface presents several irregular rounded patches of redder and more porous bone, being the places of insertion of the ribs; the uppermost of these 46, is singularly covered with smooth cartilage, as though it was designed for a moveable joint, and may have some reference to the *clavicle* of animals. Near the middle of the lower part of the chest is seen *the Heart*, 47, with its two chambers, the great and lesser ventricle, *a. b.* the former impelling the blood through the body, the latter through the lungs only; at the upper part of the heart and over these chambers, is seen the white internal coats of the *Auricles*, *c.* for receiving the blood returning to the heart, and large openings are seen for its ingress to the heart and passage to the ventricles. The Heart is loosely surrounded by a membranous bag, 48, called the *Pericardium*, formed by a duplication of the *Mediastinum*, 49, 49, 49: the *Pericardium* is attached below to the *Sternum*.

THE LUNGS, formed of two large lobes, occupy the two cavities of the chest, having the mediastinum and heart between them; there is also a smaller central lobe to the lungs, which posteriorly surrounds the heart, and is seen divided. 50. The three openings are three of the air-pipes or *Bronchial vessels*, continuations of the canal of the wind-pipe throughout the lungs, and are supposed to terminate in cells, which late observations lead us to doubt. Through an opening in the *mediastinum* purposely made, 51, is seen the left cavity of the chest with a portion of the extremity of the left lobe of the lungs, collapsed from the admission of air into the cavity; another portion of the lobe is seen near the upper extremity of the sternum in the anterior part of the left cavity 52: the ribs are also obscurely visible through the same openings, their internal surface being covered with a fine membrane called *the pleura* which lines the cavity of the chest, and is reflected over all its viscera. The oblique fibres between the ribs are the *intercostal* muscles. The large tube or cylindrical pipe 53 near the back

bone is the *aorta* or main blood-vessel from the heart, distributing the blood to all parts of the body; it is seen passing into the abdomen, where it is partially laid open, and above this opening another blood-vessel is visible, which is the *vena cava*, 54, or *great vein*, bringing back the surplus blood to the heart and lungs.

OF THE ABDOMEN. Lying against the diaphragm, making a noble appearance, is seen the *Liver*, being the left lobe of this viscus, 55. A smaller middle lobe is divided, exposing two or three orifices of blood-vessels, whose white coats strongly contrast with the general colour of the part 56. The liver of the horse is singularly circumstanced in having no *cyst* or *gall bladder*. The liver of the horse from very high feeding with oats and distressing work is subject to be destroyed, much in the same way as fermented liquors act upon the human liver; the disease so induced is called *Farey*;* too low and watery food, and exposure in damp cold ground, will also induce the same complaint, especially after high feed.

Passing backwards in the order of their occurrence, we next observe *The Stomach*, 57, a single pouch, but possessing within three or four different surfaces, approaching, though distantly, in structure to the stomachs of the ruminating animals.

The stomach of the Horse and of others of his race or family, is made the singular habitation of the *larvæ* or *grub* of three or four distinct kinds of *Bots*† or *Oestri*, whose curious history and mode of propagation we have endeavoured formerly to unfold in an essay published in the third Volume of the Linnean Society's Transactions, and since in a separate treatise, with representations of them in all their states. The curvature of the stomach presented to the liver, is called the *Small Arch* by anatomists; and its exterior convexity opposite this, the *Large Arch*; the entrance to the stomach by the gullet, 58, the *Cardiac Orifice*, its exit where the intestine has been removed, the *Pylorus*, 59. Behind the stomach, and of a bluish red colour, is seen the *Spleen* or *Milt*, 60, its usual companion, and perhaps serving some useful office in regulating the digestive process. We cannot forbear stating very briefly, that in an experiment made in the year 1792, in throwing in more fluid into the stomach of an ass than the animal was willing to drink, or than was necessary to digestion, and on introducing the hand through an incision made into the abdomen after some little time had elapsed for the digestion to be completed, this viscus appeared, on again introducing the hand, to have lost its flaccid feel, and to have become turgid, as though it had received the superfluous fluid; we mention it that it may be confirmed or otherwise by future observers in their researches respecting it.

Immediately above the spleen is seen the *Kidney*, 61, receiving its artery from the Aorta, and the *Ureter* passing from it and going to be inserted in the side of the bladder, being enveloped by membranes, its view is somewhat indistinct. 62. Is the *Bladder* collapsed and corrugated, being nearly empty of urine. Above this and lying upon it, is the *Vagina*, 68, and the *Uterus* or *Womb*, 63, the latter very small in these animals, the foal being contained, not in the womb, but the *Horns* of the womb, 64. The horn of the other side is cut off, that it should not obscure other parts, 65. To the extremity of the left horn of the uterus, and lying upwards in the figure, is attached the *Ovarium*, 66, and near it the *Fallopian Trumpet*, 67, a membranous twisted funnel, which conveys the impregnated egg from the ovarium, where conception commences, into the horn of the uterus; arrived there and adhering to its internal coats, it becomes the *Fœtus*. Within the *Vagina* is seen the opening of the

* From *farcio*, to *cram*, the legs being swollen throughout like a stuffed pudding.

† We conjecture from the French, *bout*, the end, from their appearing at the extremity of the rectum.

Urethra, 68, and the *Clitoris*, 69, projecting backwards, which in these animals gives it the appearance of being inverted in respect to its position in the opening of the human *Vagina*; but which is explained when the prone position of the animal is fully considered.

Above the *Vagina* appears the *Rectum* or *Arse-gut*; the other intestines being necessarily removed to afford a clearer view of the different organs of the abdominal cavity; *a.* is a piece of the sacculated part of the *Rectum*; the balls of dung appear to receive their form and become hardened in these pouches; *b.* is a terminating sac to the intestines, a receptacle of the dung, and appears to consist externally of longitudinal fibres, having internally a loosely adhering coat, flaccid, wrinkled and red, covered with a thick slimy mucus; the longitudinal fibres of the external sac being muscular, and contracting from the stimulus of the accumulation of the dung balls, and shortening thereby, protrudes the inner loose pouch with all its contents outwards, and forms it into numerous circular folds, which on account of their appearance and colour, have been sometimes called the *Rose*; the longitudinal fibres of the external sac ceasing to act, and the abdominal muscles relaxing, it is by the weight and descent of the intestines again drawn within the abdomen: *c.* is the *Sphincter Ani*, or *Circular Muscle* closing the rectum externally.

We now trace the lower outline of the figure. 70. Is the *Symphysis of the Pubis*, or place of union of the two bones composing it: this part is formed of an extraordinary depth or width in these animals, affording ample surface for the attachment of the muscles of progression. 71. The *Parietes*, or *Coverings of the Abdomen*, internally lined with a fine membrane called *Peritoneum*, which is extended over all the viscera, and partakes very frequently of their disorders. The lowermost edge of the boundary line of the abdomen below this, is termed by anatomists the *Linea Alba*, *g.* being a white line formed by the concurrence in the middle of the abdomen, of the tendons of its various muscles. Here the cavity of the abdomen is contracted and drawn up, from the weight of the intestines being removed. 72. Is the udder of the mare. The rudiments of the *Mammæ*, or *Teats*, which are found with the males of most quadrupeds, were discovered by Daubenton in the horse in the prepuce, or sheath of the penis (See Buffon's Natural History); and afterwards Hunter made the same remark.

73, 74. The *Sterno-Mastoideus Muscle*. 75. The *Sterno-Thyroideus*.

OF THE LIMBS.—The division being made nearly through the middle of the horse's body, does not interfere with or affect the limbs, but exposes very advantageously their inner sides; and that the plate might be rendered as extensively useful as it could be, we strip the limbs of their skin, and several tendinous envelopements and the exterior muscles are brought into view for representation.

IN THE FORE EXTREMITY is seen the lower part of the *Brachio-Cervical Muscle*, 76, passing down from the neck to the middle of the arm, extending and carrying the limb forwards very powerfully by the distance of its application from the centre of motion in the joint above; and extensive in its action on account of its length, occupying nearly the whole line of the neck; the use the horse makes of his neck is often seen in the gallop, especially if a little fatigued, but which by the absurd use of the bearing rein, is often rendered useless; it forms with the *Pectoral Muscle*, 77, a strong aponeurosis, extending over all the muscles and tendons of the upper parts of the limb, bracing them and forming a strong aponeurotic cord or tendon inside the fore arm. 78. The *Olecranon*, *Ulna*, or *Elbow*. 79. The *Flexor Mynus Carpi*, rising from the *Humerus*, or *Arm-Bone*, and terminating on the *Post-Carpal Bone*, which bone forms the bold angular prominence posteriorly in the outline of the back of the knee. 80. *Flexor Mesocynii Internus*, or *Internal Flexor of the Shank*, terminating on the internal prominence of the head of the shank bone. 81. The *Radius*, or *bone of the fore arm*, mistaken generally for the arm of the horse,

which is above it, short and concealed by its fleshy muscles. 82, 83. *Extensor Mesocymii*, and *Extensor Pedis*, extensors or straighteners of the limb after flexion, and carrying the body forwards to it fixed on the ground, one tendon passes to the shank; the other to the foot.—For a more particular description of these muscles, see Rees's Cyclopædia, article *Anatomy Veterinary*.

OF THE Hind EXTREMITY.—84. The *Tensorius*, or *Fascia lata muscle*, whose tendinous expansion, or aponeurosis, embraces nearly all the muscles of the limb; it is advantageously situated for carrying the limb forwards. 85. The *Vastus Anterior*, which with its neighbour and congener the *Vastus Internus*, 86, and the *Vastus Externus*, on the opposite side, are all contributing to one effect, being strongly inserted in the *Patella* or *Knee-Cap*, 87, which part is the real knee of the horse, but termed with us the *Stifle*, perhaps on account of the hollow pit or indent and rising skin about and surrounding it: the shortness of the thigh of the horse and its thick fleshy muscles almost conceals it from observation, it scarcely extending beyond the parietes, or line of the abdomen. The tibia at this joint is provided with a remarkable cushion of cartilage for the condyles of the thigh to work upon or act against. 88. A very broad flat fasciculated muscle (*Adductor Complanatus*), powerfully acting in conjunction with the adductors on the other side of the limb in supporting the upper part of the tibia, and in forcing the body forwards upon the limb when it is fixed on the ground; passing through a slit or division of this muscle, is seen a large vein, 89, usually termed with us the *Plate Vein*, perhaps from the French *Plât Veine*; though according to Daubenton in Buffon's Natural History, what the French call the *Plât Veine*, is situated on the inside of the fore extremity, lodged in the hollow or channel on the inside of the radius, or fore arm; the misapplication of names in common use in this art, is not unfrequent with illiterate shoeing smiths as may be expected, the greater share being French, and which appear to have been derived from the Low Countries, or our Norman ancestors. 90. Is the *Sacro Tibialis Internus Muscle*, powerfully acting in connexion with its opposed muscle on the opposite side, viz. *Sacro Tibialis Externus*, in propelling the body from the limb made fixed on the ground. 91. The *Sacro Tibialis Posticus*, a congener in its effects with the two former. 92. The *Leg Bone*, or *Tibia*, which with the muscles disposed about it, has been sometimes with us called the *Gambriel*, which appears to be a useful distinction, separating it from the other parts of the limb, is perhaps derived from the French *Jambe*, and is the *Jambriel*, or *Lesser* or *Shorter Leg*, and not inaptly applied when compared with the larger upper parts of the limb: it is this part which is commonly mistaken for the thigh of the horse, whose shortness and concealment we have noticed before. 93. The *Popliteal Muscle*, much the same as in the human. 94. The *Perforans Minor*, or *Auxiliary Perforans*, combining in the horse the properties of the *Tibialis Posticus*, and *Flexor Longus Pollicis Pedis*, of the human anatomy. 95. The *Gastrocnemius Muscle*, forming the calf of the leg in the human anatomy; its very stout tendon is inserted into the point of the *Os Calcis*, or *Hock*, 96, which part though placed so much above the ground, is corresponding to the human heel; and this tendon, in allusion to the ancient tale of Achilles being dipped by the heel in the river Styx, has been called the *Tendo Achilles*, 97. It has appeared to us to be the lower or second point of insertion of this tendon and its coadjutory ligaments that causes the disease called *Curb*, when strained and over exerted by the power which the *Os Calcis* has upon the parts below. 98. The *Perforatus Muscle*, taking its rise in the hollow pit or fossa on the outside of the thigh bone, at the back of the tibia, forming a tendon, which becoming flat and wide, covers over and strongly embraces the above insertion of the *tendo Achilles* at the point of the hock, and assisting it also by taking attachment to the side of the *Os Calcis*; below the hock, becoming a simple cord again, it passes through a restraining ligament, and arriving at the back of the fetlock joint, again dilating, it forms anteriorly a smooth

annular ligament for the passage of the tendon of the *Perforans*, and then finally terminates by adherence to the lower extremity of the pastern bone, and by spreading laterally to the sides of the coronet bone. In man there is also a *Perforatus*, but much shorter, taking its rise upon the *os calcis*, and then divides into as many tendons as there are toes; the foot of the horse, simply designed for support and progression only, often combines in one muscle the properties and structure of two or three, which are distinct in the human, as in the case of the above muscle, and which makes it difficult to follow closely or compare, and much less name them, after the human anatomy. Availing myself of the opportunity the mention of these parts gives me of introducing some account of the disease called *Grease*, which invades them not unfrequently, and appears generated by damp, wet, and cold applied to them, especially in the decline of the year. Washing and slopping horse's legs on coming in from their work, is the most usual source of it; dry rubbing with a soft wisp and leaving them till the next morning, is better; long exposure to dirty roads in the commencement of the Winter, will also produce it, and chills indeed of any kind. It is attended with considerable inflammation, pain, and suffering, especially by the distention of the edges of the claps when the animal is moved. The discharges which are highly fetid if allowed to remain any time on the parts, and are supposed, and not without reason, to be poisonous, producing the cow-pox on the teats of the cow, and therefore allied to small-pox, and perhaps by some singular concurrence of circumstances its progenitor. The cure is accomplished best by keeping the sub-fetlocks ever warm, poulticing for a few days, giving purgatives or diuretics to carry off the inflammatory disposition, then with denicatives, such as *Ægyptiacum*, the sulphat of zinc in solution, to dry up and heal the sores. A too dependant situation of the hind legs in the stable, is also injurious; turning them round therefore, with their heads to the heel posts for a few hours every day, is beneficial. To prevent it all washings without the most careful drying, should be avoided, and forbidden, especially whilst hot. The name is probably derived from the greasy unctuous appearance of the discharge, for the French call it *caux de jambes*. 99. The *Perforans*, rising behind the head of the *Tibia*, is terminating under the coffin bone, dilating beneath the furch. 100. The *Extensor Longus Pedis*, and the *Tibialis Anticus Muscles*; a remarkable restraining ligament is also seen here confining them down to the bend described by the joint.—For further particulars respecting all these muscles and parts, and some of the viscera, the reader is referred to an article published by the author in Dr. Rees's Cyclopædia, entitled *Anatomy Veterinary*.

P.S. As a very ungenerous and ridiculous attempt has been lately made to cast a doubt on the identity of the Eclipse skeleton, now in my possession, it may not be amiss in this place to notify, that this celebrated horse never went out of Dennis O'Kelly's hands, dying at his estate of Canons Park in Hertfordshire, of the gripes. St. Bel, then about to be made professor of the Veterinary College, made a natural skeleton of his bones, leaving the ligaments attaching the bones together, so that they could not in any way be changed. A few years after, Dennis O'Kelly gave this skeleton to my friend, Edmund Bond, of Lower Brook Street, Grosvenor Square, who dying, his widow who still lives, presented it to me in consequence of my assistance in disposing of her business and collecting her debts, &c.; and it never was in any other hands whatsoever. The bones also themselves, which are remarkable, would sufficiently evince their genuineness to any person not wilfully blind or prejudiced. Sixty guineas were offered me for it by the College of Surgeons, and were refused, a hundred being demanded for this invincible monarch of the race-course.

FINIS.

ON

THE KNOWLEDGE OF THE AGE OF THE

HORSE

BY HIS TEETH.

WITH REMARKS.

BY

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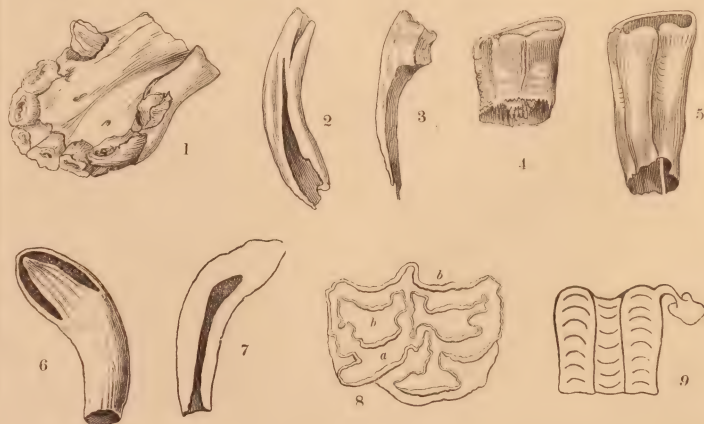
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1826.

TABLE OF THE APPEARANCE OF ALL THE TEETH

	<i>At Birth</i>	<i>12 Days</i>	<i>5 Weeks</i>	<i>2 Months</i>	<i>3 Months</i>	<i>6 Months</i>	<i>1 Year</i>	<i>1½ Year</i>	<i>2 Years</i>	<i>2½ Years</i>	<i>3 Years</i>	<i>3½ Year</i>
<i>INCIS</i> , 1st pair...	Not ap.	Appears	Advneg.	Level	Wearing	Worn	Worn	Mk. ob.	Smooth	<i>SHED</i>	H. Tooth sharp edged	Level
.... 2nd pair...	Not ap.	Not ap.	Appear	Advneg.	Wearing	Worn	Worn	Worn	Worn	Mk. ob.	Mk. ob.	<i>SHED</i>
.... Corner...	Not ap.	Not ap.	Not ap.	Not ap.	Appear	Level	Wearing	Worn	Worn	Worn	Worn	Worn
<i>ANT.</i> 1st pair...	Not ap.	Appear	Advneg.	Level	Wearing	Worn	Worn	Mk. ob.	Smooth	<i>SHED</i>	H. Tooth	Level
.... 2nd pair...	Not ap.	Not ap.	Appear	Advneg.	Wearing	Worn	Worn	Worn	Worn	Mk. ob.	Mk. ob.	<i>SHED</i>
.... Corner...	Not ap.	Not ap.	Not ap.	Not ap.	Appear	Worn	Wearing	Worn	Worn	Worn	Worn	Worn
1 Molar	Appear	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	<i>SHED</i>	Level	Advneg.	Advneg.
2 Molar	Appear	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	<i>SHED</i>
3 Molar	Appear	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.	Advneg.
4 Molar	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	<i>RISES</i>	Level	Advneg.	Advneg.	Advneg.	Advneg.
5 Molar	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.		<i>RISES</i>	Advneg.	Advneg.	Advneg.
6 Molar	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	Not ap.	<i>RISES</i>	

TUSHES, Laniarii or Canini



POSTERIOR TUSH.

ANTERIOR TUSH.

Sharp and prominent, just rising.

Rises.

AT ANY AGE OF THE HORSE.

4 Years.	4½ Years.	5 Years.	6 Years.	7 Years.	8 Years.	9 Years.	10 Years.	11 Years.	12 Years.	18 Years.	24 Years.	50 Years.
Wear ing	Wearing	Worn.	Mk. ob.					Round.	Oval.	Oblong.	Triang.	Longit. Oblong. Fall?
Level.	Wearing	Wearing	Wearing	Mk. ob.					Rounded	Oval	Triang.	
Mk. ob.	<i>SHED</i>	Level.	Wearing	Worn.	Mk. ob.					Oval	Triang.	
Wearing	Wearing	Wearing	Wearing	Worn.	Worn.	Mk. ob.	Mk. ob.	Smooth.	Rounded	Oval	Triang.	
Level.	Wearing	Wearing	Wearing	Worn.	Worn.	Worn.	Mk. ob.	Mk. ob.	Rounded	Oval	Triang.	
Mk. ob.	<i>SHED</i>	Level.	Wearing	Wearing	Worn.	Worn.	Worn.	Mk. ob.	Rounded	Oval	Triang.	
Advncg.	Adv.	Adv.	Adv.	Adv.	Adv.	We believe a well-recorded case of a Horse attaining 60 years, has occurred in this country.						
Level.	Adv.	Adv.	Adv.	Adv.	Adv.	The teeth of the famous Eclipse horse are now before me, and the incisors are getting triangular; his age, when he died, is well known to have been 26.						
Adv.	Adv.	<i>SHED</i>	Level.	Adv.	Adv.							
Adv.	Adv.	Adv.	Adv.	Adv.	Adv.							
Adv.	Adv.	Adv.	Adv.	Adv.	Adv.							
Level.	Adv.	Adv.	Adv.	Adv.	Adv.							Fail?
Risen.	Half inch long, grooved, concave within.	Large, convex without, concave within.	Fully formed.	Rather worn at the point.	More worn, and fuller on the inside.	Considerably worn and rounded.	Wearing shorter and rounder.				Rounded, and conical close to the gums.	It is probable, that life becomes extinct in these animals before the final destruction of their teeth, that is, if left to a pure state of nature.
Risen.				Much worn.			Very much worn.					

ON

THE KNOWLEDGE OF THE AGE OF THE

HORSE

BY HIS TEETH.

WITH REMARKS.

BY

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On knowing the Age of the Horse by his Teeth.

It was in the commencement of the Veterinary College, in the year 1792, that I composed this Table, apprehending strongly that it would create a smile among my friends, if, as being a young student, I should be mistaken in giving the age of a horse, I therefore, for a few months, gave my attention entirely to this object, procuring an enormous quantity of jaws and teeth from the neighbouring slaughter-houses for this purpose.

This Table is a collection of all the material circumstances which attend the teeth from birth to the latest period of life ; for the fact turns out to be, that it is the history of the teeth which forms the basis of this knowledge, taking into the account some discrepancies and anomalies which disturb its uniformity, and to which are to be added certain changes which age produces in other parts of the body.

The changes which take place in the teeth at any age are seen in the Table : if we look down the column perpendicularly for any age, we see the state of every tooth at that age ; or if we look for any particular tooth, by carrying the eye along the line horizontally, we see the state of that tooth at half-yearly periods through all its progress to old age ; so that, with this Table before him, the tyro may soon acquaint himself with every particular, and much better than by the vague, unconnected, and often untrue accounts hitherto given.

We may perhaps advantageously preface our remarks with a short view of the formation of these Incisor teeth, according to the best information we have been able to obtain, and from our own reflections ; not only on account of some novelties we introduce into it, but as being one of the most singular and interesting processes of the animal economy. Their formation appears to be nearly as follows :—A cavity, by absorption, is first formed in the bone of the jaw, which, when sufficiently enlarged, receives a deposit of a mass resembling jelly or gluten, but is more tough, and covered over by a thin fine vascular membrane ; a sac also, or membranous capsule of some thick-

ness and strength, and double, is also found to envelope this jelly or pulp: the fine membrane covering the pulp, is supposed to be an extension of the periosteum, the usual, and perhaps universal, genetrix of bone. This pulp, growing and enlarging within the capsule, becomes at length of the figure and mould of the crown of the future tooth, and assuming next the office of a gland, begins to secrete upon its surface a thin shell of bone of its own figure: this shell is not, however, formed in one entire surface at once, but by a separate deposit on the most projecting and prominent points first, which uniting, form the shell, and it then becomes general over the whole pulp, and if examined at this period, it is found but very loosely adhering to it. A thin shell of bone is no sooner formed by the pulpy gland, than the capsule, assuming a glandular property also, commences depositing upon its surface the enamel, first in parallel longitudinal lines and processes, and then by a reticulated coat, and finally a glossy covering of smoother enamel: so that by the gland within thickening the shell inwardly, and by the enamel being deposited without, the crown of the tooth is completed. And while the thickening process is going on above, an extension of the shell proceeds below, formed by the same jelly or gland, which, as it elongates, diminishes in diameter as it proceeds, and the enamelling process follows it, till at length is formed the crown, the body, and shank or tube of the tooth. The Horse Incisor in this stage is a mere hollow shell or tube of bone and enamel, enlarging upwards, and bent to the exterior figure of the jaw. The head or crown of the tooth being sufficiently consolidated, and provided with a tube or shank of certain length, is in a state for external protrusion and use.*

The external capsule, or investing double membrane of the tooth, having completed its office, grows thinner by degrees, and is at last totally wasted and absorbed. The gums also waste, and the tooth is then in a state for external appearance.

This curved figure of the new formed tooth, we may remark, brings the

* It has been formerly supposed that the investing capsule was the secreting agent of the bony shell of the tooth; but as this would only be so for a moment, or till the thinnest lamen of bone was formed, since this would effectually cut off all future communication between the capsule and the gland, so the after-thickening of this bony case inwards must entirely depend on the gland within it: and we find on examination, that the primitive shell so formed differs in nothing from the substance afterwards added, and, therefore, it is but reasonable to conclude the whole is formed by the same agent.

crown of it in a position almost perpendicular at its first emerging from the jaw, and occasions it to meet the teeth of the opposite or upper jaw nearly perpendicularly; but as the tooth wears away, and, in very advanced age, after passing through a succession of inclining angles, is at last reduced to the shank, which being placed nearly in the direction of the jaw itself, will occasion these teeth to meet the opposing teeth of the upper jaw in nearly an horizontal line, so that their internal lateral surfaces get worn, instead of their points, into an oblong irregular figure, and the reduced lean jaw bones approach each other in the same direction, the redundant skinny lips are seen protruding beyond the teeth: whereas in the youthful jaw these parts are rounded, plump, and deep in front. Accessions to the fang or posterior parts of these front teeth are made to almost the latest period of life, which accessions are flattened in the opposite direction to the compressed flatness of the crown of the fresh tooth, and thus diminish the lateral extent of the jaws. And these prolongations are, after a certain age, of solid bone, without enamel, of a yellowish colour, and very hard.

In the centre of the crown of the tooth, and externally visible, is an inverted hollow or funnel of enamel, which we have called the *infundibulum*; it has been called *the mark* by dealers, and is supposed by them to fill and grow up, but is in reality worn away by the use of the teeth, and obliterated about the sixth year.

The primitive germs and formation of both sets of teeth, must be sought in the fœtus some months before birth; but the circumstances attending the growth and progress of the teeth generally, are most beautifully to be observed by the dissection of the jaw of a horse two years old previous to their shedding a tooth. On carefully taking the jaw to pieces, we may observe underneath the two front milk Incisors, and lying within them, the front pair of the second set, now about one inch and three quarters long, consisting of hardly anything more than a shell of enamel, with the small enamel inverted cone coming down the inside of it from the crown, and tapering to a point; this hollow tube is now of the full size of the tooth, and requires only to be strengthened with bony matter for being brought into use. The second pair of Incisors are only one inch long, consisting of a shorter case of enamel, covered with a brown furred matter of an ochre colour, and the inverted enamel cone within is not closed at the point, so that you see through it. The enamel in both the cone and the

tooth terminate below in a fine thin edge, which shows that the formation of this matter commences at the crown of the tooth, and is carried downwards, thickening as it proceeds, and not all formed at the same time. The extreme upper edges of this second pair are just become white, hard, and glossy with enamel.

Of the third pair of Incisors, we have not yet any appearance, but we may observe the bone is very cellular, and here and there considerable spaces in it, so that we see a cavity is forming by the absorbents for the reception of the crown of the tooth. What consciousness leads these vessels to remove an old formation for the reception of a new one entirely different? What sense should urge these absorbents to provide a space so long before the want is really experienced? and what power is it that should direct a mere arterial vessel to become the reflecting architect of so extraordinary a structure and figure as is one of these horse's teeth! Dr. Darwin, I observe, calls this power, animal appetency, which is almost or quite synonymous to the stimulus of necessity of Hunter: want certainly may lead to an effort, but what sense directs its issue? Modern researches, have, however, much removed this appearance of mystery, by showing us that a portion or off-set from the capsule of the milk tooth is thrown off to form the second set, passing out by a channel or foramen of the alveolus for this purpose, and it is likely, though too minute for vision, that the germs of both sets of teeth are given with the fœtus, and only wait their evolution: and it is the stimulus of the presence of these germs that produces these operations.

In noticing the two first Grinders in this two-year old head, which are deciduous or milk teeth, their lower parts are so absorbed as to resemble somewhat the fangs of a human grinder. They stand astride the Grinder beneath, and are ready to fall out on the least application of lateral violence.

We may observe, that at this age the jaws are full of young and growing teeth, and must be in a particular degree tender and susceptible of injury, therefore great care should be taken that they receive no blows or violence of any kind at this period on these parts.

The Horse Teeth, on the shedding of the Milk Teeth, appear to rise in their sockets, for they are so very soon level with the remaining Milk Teeth, that it appears almost impossible the Milk Teeth can be soon worn down to them and the jaw absorbed so rapidly; whether it be so, might be seen by marking the other teeth with a file opposite the crown of the

Horse Tooth. On trying this experiment, it did appear that they really rose in their sockets to the level; this perhaps may be performed by the growth of the fang, which, lengthening backwards, forces it up. This, I since find, has been generally admitted by writers on the teeth.

An Incisor tooth, on first emerging from the socket, presents only two sharp edges of enamel, the posterior edge much lower than the front edge, and serrated; from the wear the outside and inside edge are soon reduced to a level, and proceeding further, four sharp lines of enamel present themselves from the enamel of the cavity becoming distinct; or we may describe them as two concentric circles of enamel somewhat elevated: these prominent edges must make the grasp or hold of the tooth very firm. After the enamel cavity is obliterated, for it is a more correct expression to say obliterated than filled up, (which is the common phrase of the dealers); there is then left only one circle of enamel, which environs the outside of the tooth.

The use of this hollow cavity in the Incisors of the horse appears to be to give sharpness to the upper surface of the tooth; but the very different lengths of this inverted enamel cone or *infundibulum* in the teeth of horses, and which is called the mark, occasions its obliteration to be very irregular, and, therefore, an uncertain criterion in judging of the age. This mark in the front teeth I have sometimes seen after eight or nine, and in others, as is generally the case, obliterated at six. The compressed flatness of the tooth at its early rising should be particularly observed, and also the length or degree of its exposure.

The *Incisor* tooth of the horse, when fully formed, is of an oblong conical figure, very much curved, the curvature obeying the sloping figure of the front of the jaw; and when young is very hollow in the inside. The filling up of this hollow gradually takes place from the sides towards the centre, and a section of the tooth exhibits a very elongated cone, and narrow towards the apex, and the actual filling up with solid bone does not much precede the demand for its use by the wear; in this way, with sufficient strength, the jaw is kept lighter in weight. The bone successively filling this hollow appears like a brown mark in the centre of the tooth, and enlarging as the tooth grows older, presents us with another means of judging of the age of the horse; and Vegetius appears to have made obscure mention of this. This brown or black mark, examined with a lens, appears

in a remarkable manner sometimes to have a small circle of enamel, forming a white eye in the centre of it.

If we make a section of the Incisor with a saw in several places down its body and shank, they will exhibit very much the appearances they present in the course of wear.

St. Bel used to place much reliance on the upper corner Incisor tooth being worn to an angle, always declaring the horse nine under these circumstances; we have seen, though rarely, this angle worn at seven, much depending on the distance of the lower Tush, and his manner of using the Incisors of the lower jaw, by being too much in advance, or not taking sweep enough, to grind them all to an even surface.

The *Cuspidati*, *Laniarii*, or Tushes, in the horse, are separated at some distance from the Incisores, and still greater from the Molares; they are only given to the males, though rudiments of them are often seen with the females; they are formed of harder bone than the teeth, and the part that rises above the jaw is nearly straight, the part beneath it is generally curved like the Incisors, but describing the segment of a smaller circle.

The Tush is every where covered with enamel at its first rising, and is very like a carnivorous tooth, having a sharp lacerating edge on each side, which forms a sort of arch inside by meeting at the top, the centre longitudinally projecting and convex, the outside more gibbous, but reaches no farther than the gums, where it becomes rounded and curved. Horses, in fighting, would probably make great use of them, or in tearing their own bodies, as they sometimes do in extreme anguish. For a description of their rise, change, and decay, we refer to the Table.

In judging of the age of the horse, the thickness and roundness of the Tush at its base is of consequence to be observed as affording a good criterion in forming an opinion, for though old, it shall often be sharp at its point and concave on its inside, depending on the accidental contact or its absence with the other teeth; for we find the wear of this tooth is very uncertain; in some cases it is liable to receive no friction at all, in others it is quickly worn, but the base of it, whether its point is worn or not, is almost uniformly rounded and exposed by advancing age. In ascertaining the age, it is also well to examine both the Tushes and both corner teeth, for they sometimes differ very much on the different sides of the mouth, depending on the manner of using their jaws.

Of the Grinders.—These teeth are almost entirely removed from our view, and therefore are of small value as indicators of age, but of no secondary importance in the business of the mouth and mastication, and as such deserving our earnest attention.

The *Molares*, or Grinders of the horse may be said to be larger in proportion to the size of the head, than the Grinders of most other animals, and are remarkably square and solid. These teeth are formed in linear ridges and angular elevated points of enamel. By these irregularities they grind their corn and crush the hay with much greater ease and effect, and for this reason the enamel is introduced into the centre of these grinding teeth, which are gradually filled up with bone as it becomes wanted, by exposure and wear, and the matter of the bone being softer than the enamel, is more easily worn away, and so ever leaves these asperities of enamel in prominent points and lines, to retain and divide the food.

The body of one of these upper Grinders is nearly a square column throughout, a little diminishing downwards, and slightly curved to the inside or lingual aspect, with the grinding surface nearly at right angles to the direction of the curvature, which causes it to slope inwards and towards the mouth, and to throw the food upon the tongue. The outside or *malar* aspect of this upper Grinder has prominent longitudinal ribs, and two flat surfaces, one of them more depressed, which, on the inside, is answered by a flat projecting rib of rather greater width, and the sides resting against the neighbouring teeth are nearly flat.

A Grinder Tooth of the lower jaw is smaller, thinner, and flatter in figure than the upper one, and nearly straight, its upper grinding surface obliquely shelving outwards, or in the contrary direction to the upper grinder; its inside or lingual aspect is ribbed in four or five longitudinal lines or projections, and one deep depression; the outside or aspect to the cheek has two flattened columns, with a depressed narrow line between them, which receives a process of bone from the jaw to secure it, and of the dental sides, one is flat and the other obliquely slanting. For this description, we have taken one of the middle Grinders, the extreme or end ones being sharpened to their terminating edge. These teeth are left hollow for a considerable time, and do not appear to fill up solid with bone till late, or it is wanted by exposure and wear.

The Grinders are all pretty much the same; the capsule of the third

fœtal grinder is however remarkable in sending off two dental germs or offsets, one to form the horse tooth immediately beneath, the other to form the fourth permanent grinder. The fourth again sends off one to form the fifth grinder, and the fifth one to form the sixth. The tush, it is probable, is a single primitive formation.

And it appears upon examination, that the fourth Grinder in its structure, differs from the rest in this, that the columns of enamel are not continued more than half way down the body of the tooth, and there converge to a blunt point; indeed this tooth is not so long as any of the rest, and is in part closed over at the bottom by a process of bone, like a cover, attached by processes to the sides. We have noticed in the table, that this tooth is finally shed earlier than the third, and perhaps in some instances, than the second, and this furnishes us with the reason.

The three farthermost Molar teeth are placed in the jaw, not upright, as the others, but leaning forwards, and occupying a wider part of the jaw, are of an extraordinary length.

The Grinders of the horse, with process of age, have at last three fangs, which to the young teeth are almost wanting, and the sixth with one fang more than the others. The third Molar is however the largest.

Observation shows that the enamel is deposited in longitudinal striæ, on an extremely thin shell of bone; over these striæ a harder matter is laid, having a reticulated appearance in dense irregular lines and threads; over this again is applied, or, as it were, floated, in transverse lines, a coating of the whitest, most compact, and shining enamel, which extends from the crown and prominent points downwards, covering by degrees the former structure, so that in fact three different coats unite to form the complete body of enamel. Small black points, or pores, are discoverable with a lens in the terminating edges of the last coating. The first coating of enamel will, on drying, split into regular lines longitudinally, with intervening spaces, and is much softer than the thin bony shell on which it is deposited.

We may observe, in respect to the molar motion of the Grinders, that it is not rotatory, or like one millstone upon another, in an horizontal plane, but is chiefly or wholly lateral, or from side to side, at an oblique angle, inclining upwards, so that the stroke is from either side successively. For if we observe the wear of the upper and under Grinders, they are

different; the outer edges of the upper, highest or most projecting, and the outer edges of the lower or posterior jaw obliquely deficient and worn away, which with the arched appearance of the upper teeth, makes it pretty clear that the molar motion is nearly a lateral one, or from side to centre only, and if we make this motion with the dead jaw, we bring the worn surfaces of these teeth into contact in the direction in which they are worn.

A Molar tooth of the horse, in its upper grinding surface, presents us with an almost appalling complexity of construction, where we see labyrinths and tortuous circles of enamel, winding and meandering about in the solid bone, and which the most perfect knowledge of the formation of an Incisor tooth, does not furnish us with any clue to the solution of.

By the researches of Dr. Blake, we have been taught, however, the explanation of these appearances, and we shall attempt in the following brief description, to convey a notion of the singular manner of the formation of these complex teeth.

A horse's grinder though, strictly speaking, it consists but of one piece, is arranged in so tortuous a manner, that it has the appearance of a collection of variously figured teeth, covered every where outside with enamel, as the Incisors, and held together and consolidated into one mass by an intermediary deposit, secreted into all those spaces which their irregular forms do not allow of their coming into contact or apposition of surfaces.

To trace the lines and contortions of enamel in one of these grinders, would be difficult, or to reduce them to any system; we shall, however, form some idea of their actual distribution, if we compare them to the lines and double curve of the open letter $\text{B}^{\text{①}}$ the semi-circles which are placed next the tongue, twice repeated; the second smaller, and adhering to the outside of the arches of the former; the back of the letter also is straight, but in the tooth tortuous, forming a double zig-zag, or two angular lines, making together a triple series of shells, the last is however single. On being worn, two transverse elevations of the bone appear with as many transverse depressions between them; such is the case with the upper jaw. In the lower jaw, whose teeth are narrower, only two transverse courses of shells are found; and in the fresh recent tooth, these lines are single, forming one edge of enamel, but by the wear, a double line is soon presented, as we see in the letter.

In following the process of their actual formation, we may imagine five

or six of these irregular figured tubes or cases placed together, being formed by as many pulps, first by points, and then united into one shell; these shells are quickly covered with enamel, laid on in three coats, as we have stated: first the striated, next the reticulated, and finally the glossy coat. The first, however, I consider rather as a foliated coat, being formed of parallel leaves, somewhat like the inside of the horse's hoof, to hold on the enamel more securely, and to afford, perhaps, a slight degree of elasticity and yielding: as an homogeneous, hard, chrystalline body like this, would be liable to be more easily fractured, without this softer bed to act against. Each of these may be seen distinctly by looking down the course of the tooth, from its crown to the shank, being formed in succession, and we apprehend have not been distinctly noticed before.

These shells being strengthened by enamel without, and hard bone within, are in a state to receive a most extraordinary process for their union and consolidation into one mass, which is done, according to present knowledge and apprehension, by the membranes of the capsule, which had just covered them with enamel, changing the nature of their secretion, and pouring forth solid bone between these cases, and filling up and obliterating all the intervening spaces, till the tooth becomes one solid body, and the membranes are excluded by their own secretions.

For the accomplishment of this purpose, processes are sent off from the investing capsule, which wind among all the convolutions of the shells, and deposit this bony matter. Now, it has been said, that these membranes pass down perpendicularly from the capsule, going down between the shells, and pouring out their secretions, till the spaces are filled; this view of it, however, would lead us into embarrassment, and give us an erroneous idea of the real process: for this matter is not poured out as lead might be supposed to be poured out, among some pipes or tubes stuck in a bed of sand, where the process of consolidation would commence at the bottom and proceed upwards: since, if we examine the horse's tooth, we see evidently enough, that the consolidating process begins at top, near the crown of the tooth, in order that this part should be early brought into use. Now, if these membranes dipped down perpendicularly from above, they would, by the filling up of the tooth at top, be cut off from their sources, and be destroyed, that it would appear necessary, in order to conceive this process aright, that we should consider these membranes, though standing perpendicularly, in respect to the position of the tubes or shells, to have rather a

lateral communication with the capsule, and, like the wind-screen before the fire, which, though standing perpendicularly, receives its motion, when moved, laterally : or, more familiarly, perhaps, we may compare these membranes to the *septa* of an orange, which pass into it laterally from the rind, and are appearing above and also below, perpendicularly between every quarter of the fruit ; so these membranes are entering all the convolutions of the teeth, and depositing upon the shell, enamel first, and then bone, or supplementary bone : beginning and finishing this process at the crown of the tooth first, and afterwards passing downwards, fill up the tooth by successive vertical layers, meeting in the centre, and obliterating the vacuities, and rendering it nearly solid ; and the tooth so filled up and made solid, then presents us, as we have already observed, to an enigma of no easy solution.* The outside of the tooth is also covered over with bone of the same kind by the investing double capsule, supporting the enamel outside.

This peculiar kind of succedaneous bone is rather softer than the real bone of the tooth within the enamel, and is more easily marked with the graver, and is often yellower, and in its analysis differs nothing from bone. It has been called by Dr. Blake the *crusta petrosa*, but not being a shell, which *crusta* implies, nor yet *petrosa*, or rocky, or stony, as *petros*, would signify, we have ventured to propose with diffidence, in speaking of this supplementary material, to call it, till a better name shall be found, *Stereodontum*, or *Stereodont*, from *στέρεω* to strengthen, and *ὀδους-οντος* a tooth ; and in speaking adjectively of its qualities, we may use *stereodontic* or *stereodontous*, while the two former words would require a tedious circumlocution, especially when used adjectively.

The term *cortex striatus* for the enamel, we have hardly thought less unfortunate, and could not with any pleasure follow, not only on account of its complexity, but also because it is not the property of bark to be harder than the wood which it covers, or be at times inside it. That I have preferred the use of the simple term enamel, though in some respects objectionable.

The term *striatus* seems also not well chosen, as the *striæ* are not visible externally, but by a transverse section of the tooth, when they appear as short radiating lines, having a direction towards the centre of the tooth,

* The enamel, by chemical analysis, is not found to differ very much from bone, being phosphat of lime, with a small portion of carbonate of lime, and without any cellular fibre.

and being in reality the processes of the foliated first coat we have described of the enamel.

I have seen in the possession of my worthy friend Thomas Bell, Fellow of the Linnean Society, and Lecturer on the Teeth at Thomas's and Guy's Hospitals, whose kindness in assisting me with information, and use of his elegant museum, deserves my public acknowledgements, a preparation of a foetal molar tooth of the horse, covered with its membranes, both equally injected, which shows that both the membranes of the capsule are nearly equally vascular: John Hunter having asserted, that the inner, and Dr. Blake, that the outer, was chiefly possessed of vascularity. This preparation, my friend informs me, was made by that excellent man and philanthropist Joseph Fox,* and exhibits an arched stylus or petiolus, proceeding from near the top of it, and conveying away the embryo of its future successor. This petiolus seems somewhat thin in the middle by its extension, and is about half an inch long, of the thickness of a crow quill, and holding at its extremity the germ of the tooth, being a portion of the capsule, with, probably, the modelling gland within it. This mass is about the size of a small horse-bean, and outwardly somewhat angular: it seems to have escaped like the cicatrix of an egg, conveying a portion of the membrane with it.

In the fœtus we have only three Grinders, which appear as fully to occupy the whole of this part of the jaw as the six do afterwards, the jaw therefore lengthens behind principally, and not in the same degree anteriorly, as the three horse Molar teeth are formed directly under these foetal teeth. The three posterior Grinders at this age, are to be sought in the wide part of the jaw, which posterior part is covered by the masseter muscle. It may be remarked also, that the space without teeth, called *the bars*, extending from the first Molar to the Incisors, is nearly wanting in the foal, or at least bears no proportion to the rest of the jaw when compared with the same space of the jaw when the mouth is complete.

We may remark, that the symphysis of the upper jaw, or where the two

* This benevolent character, in the early difficulties and attempts of Lancaster to form Schools of mutual instruction, seeing a danger of their failing for want of funds, gave to Lancaster, in a private donation, more than two thousand pounds, and kept the expiring cause upon its legs. He has also left behind him a most valuable Treatise on the Teeth, and especially of their Diseases.

halves unite, is singular in possessing projecting lamellæ of great length, and terminating in toothed points to render the connexion more firm.

The broad triple series of enamel shells in the upper jaw to grind against, makes quick dispatch ; nor need we be so much surprised when we see the apparatus, that a horse on his journey should so soon remove his half peck of corn. The points of the lower grinders appear to be more irregular than the upper, and fall into their depressions, and these undulations in the teeth increase their quantity of surface, and their effect also. The transverse chamels across the Molar teeth, we may observe, are perfectly straight, which would seem to show that the grinding motion must be nearly or quite so.

Having considered the teeth themselves, we shall make some remarks of a general nature in respect to judging of the age, which it may be necessary to notice in order to form an accurate judgment ; for instance,—if we examine a horse in May, and find his mouth denote neither 5 nor 6, we do not say that he is between 5 and 6, though the marks denote it, but exactly 5 or 6, as most colts are foaled in this month ; and this we are led to do, as the appearances predominate in the mouth for 5 or for 6, though it is true there are some Autumn colts, but such are of rare occurrence, and after May we should say that he had just passed 5 or 6, though the appearances of the mouth may hardly indicate that he had attained it ; for it is necessary that we should be guided by these considerations, as the teeth themselves are subject to almost endless variations in every different subject, and this is the only correcting rule that can be applied, for irreconcilable difficulties occur but too frequently ; sometimes a young Tush with old Incisors, and sometimes young Incisors with a worn Tush, and very convex and full in the inside ; in these cases we must, after considering all the circumstances, take the more predominating, and make our decision, recollecting the season of the year. The age of the mare is more uncertain and dubious for the want of the Tush ; in judging by the Incisors, it is particularly necessary to be recollected, that in the fresh tooth rising from the jaw, it is very wide and flat, with two nearly parallel cutting edges of enamel ; by wear, these are soon reduced to a level, and the lateral width diminishing and increasing in the opposite direction, the tooth produces a sort of ellipse or oval, and next a rounded figure, and finally a triangle, all of which may be seen by making a series of transverse sections of an incisor tooth down the

shank. Dealers are often led to feel the Tush only, and if they find it pointed and hollow, they are sure of a young horse; but when this part is made very full on the inside, as it sometimes is, and convex, or has been rapidly worn away by the bitts or otherwise, they will be very likely, if guided by this circumstance alone, to be led into error in believing the horse to be older than he really is. The upper Tush is latest in appearing, but is by much the soonest worn away, beginning to wear about 9, or generally earlier. I am uncertain whether this wear is done by the mouth-piece or bitt, which is usually placed posteriorly to the lower Tush, and nearly opposite the upper Tush, or whether it is the lower Grinders that do this, though they appear too remote for this effect. The wear of these upper tushes, if we examine them attentively, is in a sort of waving line, almost confined to the inside of the tooth, and is extremely smooth and highly polished, as though it had been worn by some soft body, and would lead one to conjecture whether it was not done by the tongue, or by occasional contact with grit or rough particles received with their food.

It would dilate this account too much, to enter upon all the varieties and singularities which occur in different mouths, yet some of the most remarkable may here be noted; thus I have seen the four-year old milk tooth remaining in and unshed till after six, the corner Incisor horse tooth being up and in parallel line with it and the rest of the teeth, so as to make seven Incisors in the upper jaw; this one should suppose, must have arisen from an unusually long shank or fang to the milk tooth. Sometimes we have seen the front Incisor horse tooth with its cavity obliterated, before the four-year old corner milk tooth was shed, so that the one was indicating six and the other four years old. This early detrition, or obliteration, of the cavity, must have arisen from an unusually short enamel cavity, or *infundibulum* and long fang, as we have stated, to the milk tooth.

I once remember to have seen an error of the mouth which deceived an able judge; the near side corner tooth of the lower jaw was perfectly fresh and sharp as at its first appearance, consequently indicating four years and a half; the corresponding tooth on the opposite side indicated by its wear seven or eight. On examining the upper jaw on the near side, the corner tooth, by some accident, was found to have been knocked out, so that the opposing tooth in the lower jaw receiving no friction, had consequently retained its perfect freshness.

When the front surface of the Incisors is worn, it is generally done by rubbing against the manger, and may indicate a suspicion of crib biting, though not always so, for irritation of the stomach, from foul or too high feeding, often induce them to lick, gnaw, or rub the manger.

Of the other indications of advancing age in horses, we may remark that the upper Incisor teeth become arched in front like a parrot's beak, projecting over the inferior ones, and meeting these almost in front, for the upper teeth are ever larger and stronger than the lower ones, and receive their action chiefly laterally, which occasions the formation of this arch, and so much do the upper teeth sometimes project over the lower ones, as to wear them in front to a considerable angle; whereas, at setting out, or at four or five years old, this surface is highest in front, and the back of the tooth is lowest.

The teeth of horses are found sometimes subject to decay, of which I possess various specimens; it is known by the difficulty of chewing the food, and the inflammation and swelling of the adjacent parts; in this case they have been drawn out, but are more easily punched out; this is however an extremely severe operation, and we may perhaps find a better substitute in the application of the actual cautery or acids to the nerve, or by dividing the nerve itself going to the tooth; though anti-phlogistic remedies are generally sufficient, and in the course of a long practice with horses, I never found it necessary to extract a tooth.

The sunken eye and prominent orbit, the hollow eye-pits, the grey eyebrow, the rugged temple, the lean thin muzzle, the over-hanging thin lips, the rising points of bone every where, the dry hard skin and disfigured hoofs, indicate sufficiently the advancing age, without any appeal to the mouth. The grey horse becomes flea-bitten, the chesnut dark, and the bay horse more dull.

I purchased a young chesnut mare in Suffolk for experiments on the feet, and also to observe the changes and shedding of the teeth. She shed her front Incisor tooth October 12, 1808, within a month after I bought her, which proved her to be two years and a half old; for, as we have remarked, they are foaled in the Spring, but shed their teeth in Autumn, successively at two and a half, three and a half, and four and a half, years old. The gap or space where the tooth came away was soon covered with red gum, very irregular, broken in the middle, and rising higher on the sides, but there was a view of the horse Incisor that was to emerge. She did not shed

her second pair till Christmas day of the next year; the Horse tooth was much below the rest of the teeth, and a long period elapsed before they were even. On February 9th, 1810, one tooth of the second Incisors still remained, and this was in the upper jaw, which seems to show that they shed them rather later than the posterior jaw; perhaps the fangs in these are also longer.

My bay blood stallion (Heathfield) did not shed his first pair Milk Teeth till the end of November, and the upper pair on this occasion were shed before the lower; the shank of the tooth was for some days projecting out before it fell, and the body of the tooth appeared to be held by the new tooth and the gums within, and the shedding of the teeth I thought was attended with a slight fever, which caused him to look haggard, and to be rather feebler than at other times. The four front teeth, from the first to the last shed, took about three weeks, that is, from December the 1st to about the 21st; when shed, the difference of elevation between the surfaces of the old and the sharp edges of the new was about a quarter of an inch; ten days after there was no sensible elevation, or the unevenness perceptibly restored. January 15th, the level was not near restored. This length of time would make one almost suppose that they did not sometimes rise in their sockets, but depended more upon the wear of the other teeth for restoring the level among them. The second pair of Incisors were shed not a year, as might have been expected, but in little more than half a year, so that there is considerable irregularity in the periods of this process.

It is a singular fact that the lower jaw of horses, where the masseter muscle is inserted, is sometimes in old horses worn through into a hole. Is this simply from the extreme tenuity of the bone with age, or the muscles being inserted on both sides the bone. The perforation is mostly as large as a crown piece.

FIG. 1. Lower jaw, with incisors and tush.

2. Section of an incisor, shewing the cavity and infundibulum, which sometimes at the point is found to contain stereodont.
3. A shed incisor, having the shank absorbed half away, to make room for the advancing horse-tooth.
4. Crown of an incisor horse-tooth in the shell, the infundibulum not closed.

FIG. 5. Incisor horse-tooth ready for protrusion.

6. The tush seen internally.
7. Section of the tush.
8. View of the windings of the enamel in the third upper grinder—*a*, the bone, *b b*, the stereodont.
9. The capsule covering a fetal grinder, and sending off the germ for the horse-tooth.—See p. 12.



COMMODUM EQUINUM;

OR,

A VERY CONVENIENT AND SECURE PORTABLE SURGERY AND PHARMACY.

1. SURGERY.

2. MEDICINE.

The Contents of these Six Cases are described hereafter.

Explanation of the Labels, which denote also the proper Divisions of the Subject.

3. **FERRIERY**, containing various kinds of Shoes, &c. 4. **FOOT** exposed. 5. **HIPPOCOMIA**, or, On the dressing & conditioning Horses.
6. **EDUCATION** of the Horse. 7. **EDUCATION** of the Man rightly to use him.

PHARMACOPŒIA EQUINA;
OR,
NEW PHARMACOPŒIA
FOR
HORSES.

BY
BRACY CLARK, *F. L. S. of the Academy of Sciences of Paris, Nat. Hist. Soc. of Berlin, and
Honorary Member of the Nat. Hist. Society of New York.*

Dum meliora proveniunt.

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INTRODUCTION.

IN sickness, how long has this worthy animal been the sport of a delusive system of ill treatment, and to his distresses, instead of assistance, has been added gross abuse ; as though, from his being placed lower in the order of creation, any vile thing would do for his medicine, or any man, however ignorant, for his physician ; yet is he possessing the same elements of matter, the same laws of life, and nearly the same organs as man himself. Placed at the mercy of the ignorant, what nauseous and inconsistent farragoes are forced upon him.

Men, without the smallest previous knowledge that should fit them for such an employ, are occupied, self-appointed, in being his physician ; of this description are the generality of shoeing smiths. These men, by long habit, have become as it were the legitimate physicians of the horse ; it is however, to be remarked, that the blacksmith has not always been his physician ; for, only since the invention of the iron nailed shoe has he assumed this employ, and which may have been the custom during a period of perhaps about twelve or thirteen hundred years, not more ; before this, veterinarians, educated for the purpose, according to the knowledge of those times, were occupied with this profession. This we learn from the writings of Apsyrthus, Pelagonius, Hierocles, Vegetius, and others ; and the Roman armies, especially of the Eastern Empire, or Byzantium, employed and supported them.

The Smiths or Farriers,* it is obvious, could never, by their employ, attain a knowledge of medicine ; and true it is, they did not discover, or know, even the principles of their own peculiar art, or that there was a fundamental defect in it, fraught with a complexity of evil : the fixing for an indefinite period an inflexible bar of iron upon the *elastic* foot was to them of no consequence, though opposing Nature's chief law in the construction of all feet. This elastic principle, though simple in itself, is as necessary to be understood in respect to real good shoeing, as gravitation

* From *Ferrum*, Iron.

to the astronomer; polarity of the needle to the navigator; or electricity to the meteorologist. The sufferings of the animal from this source, I have endeavoured to pourtray in another publication exclusively on this subject,* but believe, that language cannot easily be found to reach the amount of their wrongs from their ignorance in this respect.

But to return to their Medicine. Of the wretchedness and insufficiency of the smiths, for the administration of equine medicine, we may have pretty demonstrative proof by a cursory view of their pharmacy, situated for the most part in some back-kitchen, or hole under the stairs, or dirty box placed against the wall in some obscure corner of the forge, shunning the light and observation, and beset, as though in mourning, with cobwebs and smuts of the chimney. A stone jar of raw oil of vitriol, another of spirits of turpentine, a bottle containing corrosive sublimate, and another butter of antimony, all unlabelled! an assemblage of dirty crocks and greasy broken pots, a filthy ladle for boiling tar, and some tow; to this motly list is commonly added a bottle of oil of aniseed, to serve on all occasions, to convey by the smell a delusive notion of the true nature of their compounds. These acids, or *ails*, as they call them, concentrated or diluted, simple or compounded, as it happens, mingled without measure or judgment, are dealt out to the unfortunate sick, and, like the ills of Pandora's box, prove but too often the heralds of misery and death, rendering incurable, trifles, which often might have been easily cured. Their system of physic, if system it may be called, has remained probably unchanged or improved, from its commencement, and is but the system of "the blind leading the blind." A ploughboy, seeking work, enters a forge, and in a twelvemonth's time, by their system, becomes, by the use of this dingy cupboard, a conceited physician of the horse.—How much longer shall such abuses be permitted?

Sad consequences from such physicians might well be expected; and in the course of a pretty long and extensive practice, I could mention, from my own experience, several. Of this kind was the following: A gentleman riding his mare near Greenwich, she fell with him, and cut her knee with the gravel, and tore up the skin in front of the knee. He immediately sent for a farrier, who came and applied something to it; he then returned to town, bringing her with him. In the morning I was sent for to attend her, but in vain; for, on taking off the dressings, the whole of the parts in

* Dissertation on the Foot and Shoeing, 6 parts, 4to. Second Edition, with numerous plates of new objects, £1. 11s. 6d.

front of the bones of the knee sloughed away, and came off with the bandage *en masse*, leaving the bones almost bare. This could have happened from no other cause than the application of some most destructively corrosive medicine; and there is little doubt it was their favorite oil of vitriol, in a concentrated state. Of course she was obliged to be destroyed; and such things, I may say, are not by any means unfrequent.

Where there is a violent disease, a violent remedy, say they, must be administered; and to give a strong drink, there must be something strong in it—and what is there so strong as *oil of vitriol*? By such logic as this, I have no doubt, thousands have come to their death; sometimes to the astonishment of their owners.

As an example of this, I was sent for in haste to two very fine coach horses of a gentleman, that were extremely ill; and sure enough, before I could get to them, it being a few miles out of town, one was dead, and the other with difficulty recovered; this sudden death could not have been the natural course of the disease, having had only slight colds before; or rather the idle coachman indisposed to turn out, it being mid-winter, had artfully reported them ill to his master, and to confirm it, sends for the country blacksmith; the next day one was dead, and the other with difficulty escaped; his death was accompanied with great agony, cold sweats dropping from him at every pore, and not as horses die with inflamed lungs; so that the drink given him could have hardly been more or less than the *strong drink* above alluded to.

No art has perhaps ever been more ignorantly conducted than this pretended medicine of horses; which has been often little better than a mockery for the purpose of gain. And it is notorious, that drugs, *effête* and useless, are laid by for the farriers by the trade, and are sold them cheap accordingly, though acknowledged useless, and of no virtue whatever.

There is a favorite mixture of theirs, of almost constant application, and which ought not to be passed over in silence; it is their *hot oils*, or *ayles*, as they call them, generally employed as a wash or embrocation for recent hurts and injuries. This precious mixture, to those who may be desirous of being made acquainted with it, is composed of nearly equal parts of oil of vitriol, oil of turpentine, and common or linseed oil: it is unfortunately used in cases requiring the most emollient and allaying medicines, as bruises, strains, and recent injuries. The following is an instance of its application: in attending a sick horse, at a livery stables,

I was requested by the master of the yard, as a matter of favor, to look at his own riding horse, which had met with a strain of the leg. The horse was lame, and in considerable pain, more than I apprehended could proceed from the hurt; the superior or muscular part of the limb appeared much swollen, the hairs staring asunder, the skin visible between, oozing lymph, and extremely hot and painful. On applying the finger to the part, and touching it with the tongue, it tasted pungently acid, so that there could be little doubt it was the same favorite oil of vitriol. I merely recommended the removal of it, by a washing of warm water, and a fomentation or two of soft herbs, and a bleeding; the horse immediately became sound, so that he was only lame from this virulent application. Other instances I could adduce of a similar kind; but apprehend these are sufficient to show the danger of employing such very illiterate characters in surgery or medicine. Though sometimes I have thought that grossness and brutality appeared as a recommendation, with some, for employment in this profession.

There yet remains another very logical phrase of these men, a metaphor, more destructive than the sword, which ought also to be exposed: it is this: "*that if the poor horse is ill, he must needs want a cordial,*" though the animal is actually labouring under an attack of some inflammatory disorder, (for his internal complaints are chiefly of this description,) by giving cordials, they every way augment the disease; instead of resorting to large bleedings and diluents, which they ought to have employed. It is high time, indeed, these animals, and the public also, should be relieved from such abuses; and I ardently hope, and humbly trust, the following pages will in a degree contribute thereto, by rendering more clear and simplifying the treatment that should be pursued with horses.

Though much is said about horse medicines, the really useful may be reduced into a narrow compass; his powerful frame was certainly never intended for a display of the delicately poised arrangements and petty combinations of the apothecary's art; he would indeed have been ill suited to the purposes for which he appears designed, if he had been so circumstanced. Small effects are not at all discernible with him; and of alteratives or mercurials I doubt much the utility. By diet and regimen much may be done; and to raise or depress the powers of the system, as his diseases are mostly inflammatory, is nearly all that appears to be necessary with him.

Of his maladies, the principal are those artificially induced to the feet, by the shoeing, from its deleterious principle, various abuses super-added;

next, by work too laborious for his strength, and exertions too long continued; stables too close, and afterwards exposure, incompatible with such previous close confinement; food too stimulant also disposes him to inflammatory complaints; all draughts of air are dangerous, and all unnecessary sloppings and drenchings of water whilst warm.

The Pulmonary system in the horse is immense; and inflammation of the lungs is the grand disease we have to contend with, sometimes connected with that of the bowels and liver, and requires to be reduced, by the free application of a simple but powerful instrument, *the lancet*, which should be used with a bold hand. A valuable hint also to the inexperienced, as it is an easy error for practitioners to fall into, is, that during extensive bleedings, purgatives must be used with the greatest caution, as they produce a much greater effect or even a metastasis of the disorder from the lungs to the intestines; a diarrhœa, or violent purging, ensues, which is truly difficult to stop, and frequently destroys the horse; very small doses only can be administered, or perhaps still more safely a laxative diet. The best indication for the employment of the lancet, is the heat under the tongue, the turgid vessels of the *conjunctiva* of the eye, and pituitary membrane: as to the pulse, from the smallness of the artery, and thickness of the skin and hair that covers it, it is perhaps less to be depended upon, though, for appearance, generally resorted to by the practitioner. The appetite for the most part improves when the bleeding has been carried far enough, and the return of health soon follows. If the viscera however have been previously disordered, or have suffered by a neglected or careless bringing up of the young foal, they may give way to the violence or shock of the attack, and death ensue; otherwise, this treatment, if timely resorted to, is generally attended with success.

Of idiopathic, or pure *fever*, there is none I believe in the horse; what is called fever with him, is constantly the inflammatory affection of some organ or organs, and by far the most frequent of the *lungs*.

There is however one disorder of this animal that appears not reducible to the simple system we have laid down, but which forms an exception to it. Excessive hard labour, and very high feeding, applied together, undermine the healthy actions of the stomach and viscera, after a time, according to their various strength, and give rise to a singular train of appearances, which are denominated by the general term *farcy*; of which the *glanders*, though casually receiving a distinct appellation, is probably only a more virulent variety. Appearances of the same kind also take place on excessive reduction or depression of the animal, as by turning

out in low damp situations, especially, if foundation has been previously laid by the above measures of high feeding, &c. For high feeding, we may remark, is not a proper, or at least a salutary compensation for such unnatural exertions, as it is most commonly apprehended; that it would evidently be more politic and a saving in the end, to employ more power, or in other words, more horses, than to ruin and destroy the few in this way. Spices with tonics and bitter medicines to the stomach, are most efficacious in this disorder of which I propose to give some *formulæ* hereafter; a remission of labour and a bleeding, if much inflammation exists, moderate exercise and good grooming, appear the most successful means of removing it. The loss to coachmasters by this disorder is prodigious: a great share of which might, I believe, be prevented by a careful attention to the early appearances of the complaint, and setting them aside for treatment before it becomes desperate, which they are not often inclined to do, and then not sufficiently persevering in the measures necessary.

If to the above general remarks on the Equine nosology, we add the affections of the limbs, from violence and over exertion, as *Strains*; *Relaxations* of mucous capsules; *Synovial puffings* of the joints and *Enlargements of bone* from diseased periosteum; which in their recent stage require soothing applications, and after the inflammatory actions subside, blisters and other stimulants; we shall then have a brief outline of the most material part of the simple practice of horse medicine.

In human disease it is often difficult, though aided by speech and description, to ascertain the precise part that is diseased; the difficulty is truly great, therefore, where neither of these can be brought to our aid, or any external indication to guide us, or any swelling or sensible alteration of temperature in the part; such cases may be deemed, without any offence to truth and common sense, *obscure cases*, yet in the practice of common farriers, no such cases ever occur; they think it an impeachment of their skill and knowingness to acknowledge any such thing, and in this case, without the trouble of any nice enquiry, or minute investigation, fix at once upon the shoulder, if before; and upon the round bone or stifle, if behind; though these two great and strong parts of the limb are the least subject of any to be out of order. We shall not, however, blush to acknowledge, that a large share of horse cases are very obscure; and some so perfectly so, as to elude the penetration of the most vigilant. He who takes most pains, if he has a knowledge of the parts, and good common sense, will arrive at the best and soundest conclusions: therefore let none be ashamed or afraid of admitting there are difficulties.

MATERIA DIETETICA EQUINA, OR THE DIFFERENT KINDS OF HORSE FOOD.

DIV. I. FODDER OR HERBAGE.—*Pabulum.*

GRASS, composed of	Poa annua. The general green covering, or carpet of the earth Poa trivialis Poa pratensis BENTS, OF HIGH GRASSES. Lolium, perenne. Darnel, or Ray Grass..... Dactylis glomerata. Cocks-foot Grass..... Alopecurus pratensis. Meadow Foxtail Grass Cynosorus cristatus Agrostis vulgaris Anthoxanthum odoratum. Sweet scented Grass And others less copiously.*	Dried, forming HAY: the chief food of Horses.
CLOVER.	<i>Trifolium pratense.</i> Purple Clover.	
	<i>Trifolium repens.</i> Dutch or white Clover. They are held as a stronger diet for horses than the common meadow hay.	
SAINTFOIN.	<i>Hedysarum Onobrychis.</i>	
LUCERNE.	<i>Medicago sativa.</i> Highly nutritious for horses. Of this family also was the ancient very famous <i>Cytisus</i> .†	
VETCHES, the green Herb, or Tares.	<i>Vicia sativa.</i> Much used in the spring for foddering horses. It is objected, that they are apt to sweat much with it; and unduly exposed at their work, catch cold; inflammation of the bowels takes place, and then affections of the brain, termed staggers. They are given also in the metropolis as a salubrious substitute for turning out to grass.	
VINE LEAVES.	<i>Vitis vinifera.</i> The leaves of the vine are collected and laid by for winter food for horses in various parts of France.	

* It is to be remarked, that the *Ranunculus acris*, or *Crowfoot*, and other plants of this kind, are growing abundantly in the richest meadows, and so scattered with the grass, that it is next to impossible the animals should not receive now and then, in spite of all their care, a portion of them: they serve, perhaps, though poisonous in large quantities, when taken in this way, as a stimulus or pepper to the stomach in quickening digestion. The *Polygonum Hydropiper*, in watery situations, is also particularly pungent, and perhaps serves the same useful purpose. Herbs of every kind, we may remark, are mixed in hay in still greater abundance, as the scythe knows no distinction; and hence it is perhaps, if long continued, and alone, as I think I have distinctly seen, not a very wholesome food for horses.

† This appears to have been the *Medicago arborea* of Linnæus, found in Italy, the Levant, and shores of the Mediterranean. A variety of it, of extraordinary luxuriance, and improved by cultivation, was perhaps the plant so extolled by Virgil, Pliny, and especially Columella.

- DYER'S WOOD.** *Isatis Tinctoria.* In Hungary this plant has been found useful food for horses. Three or four crops are obtained of it in the course of the year, and it continues fresh and green in the hardest frosts, and under the snow: once planted, it propagates itself by the falling of its seed without farther trouble. M. Bohadsch. Instructions, &c. Tom. III. p. 347.
- ACACIA TREE.** *Robinia Pseudo-Acacia.* In the torrid zone, where sand abounds and no grass is found, this elegant tree appears the substitute for grass—the animals browsing on its pinnated foliage. Horses in this country, I have observed, are fond of it, and feed on it voraciously. It has appeared to me, that in good soils, the earth may be made to bear a triple stock or crop of food for horses; the lowly grass, the shrubby *cytissus*, and the lofty *acacia*.—In Valentia, and the south of Spain, bordering on the Mediterranean sea, the fruit or pods also of the *acacia* are given to the horses, when fully ripe, and make a nutritious food.
- RYE.** *Secale Cereale.* The entire herb often given in the spring, before grass comes, sowed to clear the ground from other crops being early got off. Probably more nutritious than hay, but less so than pulse or grain.
- CANE TOPS.** *Saccharum officinarum.* “Cane tops, or the tops of the sugar cane are collected as food for horses, in the West Indies. They are deemed more nutritious and wholesome if partially dried in the sun, and then laid in heaps to be sweated before they are eaten. In a season of abundance, says the writer, great ricks of cane tops (the butt-ends turned inwards), should be made in the most convenient corner of each field, to supply the want of pasturage, and other food; and these are very wholesome if chopped small and mixed with common salt, or sprinkled with molasses, mixed with water. Yet the cattle require change of food to keep them in strength, such as Guinea corn, and a variety of grass.” Cyclop. Art. Plantation.
- MAIZE, or INDIAN CORN.** *Zea mays.* The plant. “When Guinea, or Indian corn is planted in May, and is cut in July, in order to bear seed that year, that cutting, tedded properly, will make an excellent hay, which cattle prefer to meadow hay. In like manner, after the corn has done bearing seed, the after crop will furnish abundance of that kind of fodder which will keep well in ricks for two or three years.”
- WHEAT STRAW.** *Wheat Straw, Rye Straw, Oat Straw,* serve to form good beds, but
- RYE STRAW.** alone, make indifferent food. Chopped coarsely and mixed with
- OAT STRAW.** clover, or other hay, it usefully serves to divide it and make it fill the stomach; and mixed with barley it makes excellent food; much used in Spain, in Sicily, and the East, where there are no oats.
- CAPIM.** *Panicum Spectabile.* In the torrid region of Brazil, almost destitute of grass, they use for fodder a plant called *capim* or *Guinea grass*; in

height and appearance it resembles the sugar cane, and has broad, long, luxuriant green leaves; it is exceedingly prolific, and yields large successive crops of sweet succulent fodder. Obtained originally from the Guinea Coast of Africa. Walsh's Brazil. Vol. ii. p. 12.

DIV. II. MANGER MEAT.—*Frumenta*.

GRAIN.

- OATS.** *Avena sativa*. Varieties. White, Black, Red, Poland, Potatoe, &c. when baked, and afterwards ground, forming the useful article, *Oatmeal*.
- BARLEY** *Hordeum distichon*. The most ancient food of horses. Germinated by wetting, parched, and then ground coarsely, forming *Malt*; perhaps of all food for horses the most nutritious. Barley and chopped Straw is extolled by many writers as excellent food for horses, and as particularly giving high health and spirits.
- BRANK, or** *Polygonum Fagopyrum*. Making a black bread; with which in Holland
- BUCK WHEAT.** and many other countries they feed their horses. It appears to be very laxative from what I observed.
- MAIZE, or** *Zea Mays*. *The Seed*. This is the *Corn* of the Eastern World, and of
- INDIAN CORN.** the Scriptures; given to horses, it is apt to clog the stomach, and not digested, will affect the feet in a singular way, and the hoofs fall off. In America, this not unfrequently happens on a journey. The Greeks also describe this complaint, under the term *Chrithiasis*, see Podora, p. 35, on Founder. It should be diluted with chaff, or other food, as it appears to be too clammy for digestion when given by itself, and especially if hastily eaten. The **MILLET**, *Millium effusum*, follows, when the other is no longer in season, and is given plant and seed together.
- BRAN.** *Triticum hybernum*. The outer shell of the wheat. It is laxative; and often changes the colour of the dung to a lighter brown or yellowish cast. I have been led to apprehend its laxative effects proceed from the mechanical friction of the rough particles or scales of the bran upon the inner coats of the intestines; as the wheat without the bran in bread is not particularly laxative.

PULSE.

- BEANS.** *Vicia Faba*. Supposed to be the strongest and most heating food of horses. Beans, especially imported, are subject to a weevil or maggot, (*Bruchus granarius*) and is supposed very detrimental to horses.
- VETCHES.** *Vicia sativa*. The seed. In some counties given to horses, but not frequently: their precise effects perhaps not ascertained. Knowledge from actual experiment on all these kinds of food is much wanting.

ROOTS.

- CARROTS. *Daucus carota.* A cooling and nutritious autumn food for horses.
- POTATOES. *Solanum tuberosum.* Horses eat them sliced, and some boil them; but are not so fond of them as carrots.

FRUITS.

- GOURDS. In the American Illinois, these, chopped coarsely, are very much given to the horses for food. And in Spain, not only the *Acacia Pods* but, dried *Figs* also are commonly given to horses.

DIV. III. ANIMAL FOOD.

- FLESH. Though the horse is naturally an herbivorous animal, yet there is no doubt he may become by habit a carnivorous one; and so can even a sheep, as John Hunter taught a lamb to eat beef-steak out of his hand. In a magazine, I have seen a well attested account of a colt that was in the practice of visiting a pantry window that looked into his paddock, and of stealing and eating mutton, beef, veal, and poultry: pork he seemed to reject.
- In the East Indies, meat boiled to rags, to which is added some kind of grain and butter, and made into balls, is thrust down their throats. *Carpenter's Introd. to the Wars of India.* Also sheep's heads, during a campaign, are boiled for them in that country.
- FISH. In Iceland, it is stated by Buffon, that dried fish is made the food of horses; and my friend, William Bullock, Sen., lately informed me he saw them in the same practice in Norway.
- MILK. *Lac Vaccinum, Caprinum, Camelinum.* The Arabs, when fodder fails, use milk for feeding their horses, and in travelling over the desert.

PROVOCATIVES TO APPETITE AND DIGESTION.—*Condimenta.*

- SALT. *Soda muriata.* Stimulating the coats of the stomach and assisting in dissolving the food.
- SPICES. *Pimento, Ginger, Pepper, Mustard, &c.* exciting the stomach to a quicker action, and perhaps greater secretion of gastric liquor.

MATERIA VENENATA EQUINA.

I briefly collect what few facts at present exist, on good authority, in this department of Horse knowledge.

- DIGITALIS } *Fox Glove.* Half an ounce of the dried powdered leaves of Digitalis was
- PURPUREA. } made into a ball, and given to an ass at nine in the morning; at nine in the evening he died. The utmost languor and debility of the system

was produced about a quarter of an hour before death; till which time he remained apparently unaffected; not the least disposition to perspiration was observed: some thick slime came from his mouth a little before he died. On opening his stomach it was rather inflamed.

Four ounces of the fresh green plant, beat into balls, was given to a horse not diseased, except by a swelled leg; it produced no externally sensible effect.

One pound of the fresh leaves, beat into nine balls, was given him; in a few hours it brought on a surprising coldness of the ears and legs, the pupil of the eye was nearly closed, a quick languid pulse; at length cold clammy sweats, which terminated in death; the lower lip hanging down, the legs trembling, and profuse perspiration; he died cruelly convulsed, his skin quite cold everywhere. On opening this horse, there was neither inflammation in the stomach or intestines; its being given green and fresh was the cause of its not affecting the membranes of the stomach, as the dried powder did that of the ass.

Dr. Willan has observed, that in the human it has the valuable effect of lessening the action of the heart and arteries, without debilitating the general system as evacuants do, and may therefore be of great use in some diseases.

YEW TREE. *Taxus Baccata.* Professor Viborg presented twelve ounces of the green plant to a horse that had fasted four hours; he eat of his own accord eight ounces, which proved fatal, as he fell dead without any indication of suffering at the end of one hour from his swallowing it. The same effects were produced by six ounces in an experiment of M. Bredin, and Henon of Lyons. A mule died five hours after taking six ounces mixed with some hay. They all died suddenly and without convulsions. The only effect observed on examination after death was, that the intestines of the mule had small spots of extravasated blood, about the size of the human nail. But what is singular, is, that eight ounces of the Yew plant, with twice as much oats, did not kill or produce any sensible inconvenience, and the same result took place in three or four experiments of Prof. Viborg.*

Poisons, though they may form a class of themselves, branch into both food and physic by indefinable gradations.

HEMLOCK. *Conium Maculatum.* Has been known to kill horses, that through hunger or want of smell have partaken of it.

WATER DROPWORT. *Eranthe Crocata.* Most malignant to animals. I remember once, at Worcester, seeing a horse lying dead on Pitchcroft Ham; the carcase

* It would appear from this, that it is the imperfect digestion of the herb that makes it poisonous, exerting then its baneful influence on the coats of the stomach and its nerves, and so producing death, perhaps by sympathy with the brain. It is deserving of deeper investigation. See *Treatise on Cholera*, London, 1832.

very much swollen, almost to bursting. It was not far from a broad watery ditch, on that side of the flat nearest the infirmary. On examining this ditch, I found the *Oenanthe Crocata* in great abundance, which I apprehended was the cause of the misfortune.

WATER HEMLOCK. *Circuta Virosa*. Linnaeus describes it as very fatal to animals. In his Lapland tour, he says, the people of Tornea lamented bitterly the loss of their cattle, many perishing every year. On visiting the meadow near the town, he found a large bog or marshy place, where grew in abundance the *Circuta Virosa*, and in the spring luxuriantly. The animals kept from green meat during the winter season, feed on it voraciously on being first turned out, which occasioned the fatality. I am inclined to believe, had these unfortunate people administered to the animals, as early as an hour, or even two, after their seizure, a pint of hot water, a quart of rich oatmeal porridge, and half a pint of the Gripe Tincture, the last to be repeated, if occasion required, with warm clothing, and hand-rubbing the abdomen with flannel, they would have saved the greater part of them. See *Treatise on Gripes*, London, 1816. May we not see in this the vast value of the *Polygonum Hydropiper*, and other hot stimulating plants, in these humid situations, almost inevitably nipped at times by these browsing animals.

WATER PARSLEY. *Phellandrium Aquaticum*. Also very poisonous.

OPIUM. *Papaver Somniferum*. I introduce this among the vegetable poisons for the sake of a useful caution, having observed, that although to the sound horse large quantities can be administered with impunity, yet after or during purgatives, it brings on a violent and fatal inflammation of the intestines, of which I have seen three distinct and well marked cases. It is the more to be guarded against as people are often induced to administer it in order to stop a too violent purging.

ANGELICA. *Angelica Archangelica*. Vitet recommends it as a diaphoretic. Half an ounce of the root powdered was given to a sound horse (Oct. 30, 1793;) he was kept warm, and observed two hours after, his pulse was quickened 20 strokes in a minute; no other visible effect was produced. An ounce was then given, and produced no diaphoresis or sweating. Perhaps a steam-room, after the manner of the Russians, would afford us the best means of procuring diaphoresis in the horse where exercise is forbidden; and as its operation is certain and can be withdrawn or tempered at pleasure, it perhaps would therefore be better than any medicine; as diaphoretics of the horse, by medicine, are those which produce most violent and distressing effects upon the stomach, and probably injure it.

HUMAN PURGATIVES *not acting on horses.*

- JALAP.** *Convolvulus Jalapa.* The root powdered. One ounce according to Vitet produced no sensible effect; two ounces brought on beating of the flanks, convulsions, and death. The stomach was found very much distended and the pylorus inflamed. Vol. 3. p. 105. Two ounces of the resin of Jalap, also killed the horse.
April 4th, 1792, six drams of Jalap was administered to an ass, by myself, at our Veterinary College; it produced no sensible effect.
- ELATERIUM.** *Momordica Elaterium.* I was desirous of seeing, as the ancients used the *Cucumis Sylvestris*, if this, which is supposed allied to it, or the same, would have any purgative effect on the horse. One scruple was given to a grey horse at the Veterinary College (April 26, 1793) it took away his appetite for a few hours, but produced no other apparent effect. Vitet says that a dram was given in powder, and increased to half an ounce during a course of sixteen days, but produced no sensible effect.
- GAMBOGE.** Two scruples of this drastic purgative, made into a ball, was given to an ass; it produced no sensible effect. Two drams was then given, which produced no sensible effect; some days after half an ounce was given, without any purgative effect. One ounce was administered to a horse: it produced considerable distress, rendering the respiration more laborious.
- COLOCYNTH.** This perhaps like the former, would very much irritate the stomach and bowels, without producing any purgative effect; though I know of no direct experiment upon it, and have been cautious of unnecessarily adding to their sufferings by such experiments. The absurdity therefore of putting such things as these into horse physic is evident; and the excellent operation of the aloes upon them seems to render such quite unnecessary. Vitet, I observe, has given it to a horse from half an ounce to two ounces and a half, without producing any very sensible effects.
- CASTOR OIL.** By reasoning from the human, this medicine has also been imagined of great use as a purgative. I never saw it produce any such effects when administered alone; and, in order to see whether it had this effect, I gave to my own horse, a chesnut Welch galloway, about fourteen hands high, January 23, 1802, nearly a quart bottle full, procured expressly for the purpose. It disordered him for a few hours, and took away his appetite: it however did not produce hardly any relaxation of his dung.
Manna, Senna, and other human purgatives, seem also from their effects, equally objectionable, as well as by their price.

CALOMEL. In cases where it has been difficult to give a purging ball I have tried the calomel in powder, in a mash, as a more easy mode of administering it, from a dram and a half or two drams and a half; but it seldom produced any such effect. Bran mashes given with it will relax horses; and has been often mistaken for the effect of the medicine. For the origin of this word *calomel*, see *on Ancient Shoeing*, p. 10.

GLAUBER'S SALT. This salt, given by me as far as a pound to a horse, produced hardly any purgative effect; but increased his urine considerably. Vitet also experienced the same effects. I have administered this salt in a violent diarrhœa of the horse, from an over dose of aloes incautiously given in inflammation of the lungs, and it suppressed the purging very usefully, and effected a cure. Its utility in this respect I have since confirmed in several cases. See also *Treatise on Cholera*, p. 7.

HUMAN EMETICS *not acting on horses.*

EMETIC TARTAR. *Antimonium tartarizatum.* I gave to an ass, at the Veterinary College, March 12, 1793, one ounce of emetic tartar mixed up with honey and liquorice powder. I could not perceive any change whatever that it produced; he eat very heartily after it all day, so that it did not excite even nausea; and two days after I did not perceive him at all ill. Two ounces were then given to a horse, without any sensible effect. Pigs, it is said, will fatten by its use. To dogs it is, however, a very active and useful emetic in small doses.

IPECACUANHA. *Psycotria emetica.* The powdered root. Vitet observes, that from half an ounce to an ounce given to a horse, makes him snuffle and sneeze for some minutes: at the end of an hour, he appears agitated, the belly tense, but not with increase of volume; the arteries and flanks beat with violence for four or five hours, these appearances gradually go off, and at the end of twenty-four hours entirely disappear; the dung not in the least altered in consistence. Given to the extent of three ounces, it distresses the horse greatly; he lies down and gets up, his flanks beat, he sighs and groans, and if copious water is not given him, he dies convulsed: on these symptoms going off, his dung is somewhat moistened, but not purged. If he dies, the stomach is found distended, the pylorus inflamed, the naked membranous part of the stomach of a deeper red, and the blood vessels enlarged.

KERMES MINERAL. Vitet says, this does not act at all on horses as an emetic, even in the dose of two ounces. Indeed, for wise reasons it appears that the **SULPHURET** horse's stomach is rendered insensible to these stimuli;—how unsightly **OF ANTIMONY.** and dilatory on a journey would be such a proceeding! I was informed, however, in Denmark, that white hellebore root would have that effect, placed under the skin of the horse.

WHITE HELLEBORE. *Veratrum album.* Two drams was given to a horse of this root, in powder, mixed up with linseed meal in a ball, April 26, 1793: in about half an hour he shewed great pain by moving his legs, principally the hind, alternately resting on one of them, his fore legs the same, but not so much, his pulse rather quickened, with a short cough, and his head held down. This powder has sternutatory effects on this animal blown into the nostrils, producing coughing, and a flow from the nasal duct. Perhaps in ophthalmies it might be a useful adjunct to other remedies.

BLUE VITRIOL. *Sulphat of Copper.* This violent emetic does not so act with horses, as also the other metallic salts. When large quantities are given they uniformly produce distress, and probably inflame and injure the mucous linings of these parts. It is a singular phenomenon, that whilst his stomach is so little sensible, the skin should be more sensible than the human, as is shown by the effects produced by cantharides, oil of turpentine, &c.

WHITE VITRIOL. *Sulphat of Zinc.* A sudden and strong emetic in the human. We have used it in small doses as a tonic, with the horse, and in this way believe it preferable, as being more astringent, than the sulphat of copper, or of iron; especially when combined with the cantharides.

Various medicines, and of very different effects are lumped under the coarse term, *Alteratives*; perhaps in the horse of little or no use; that is to say, what is proposed by them, can be effected by more certain and simpler means.

ANTIMONY. *Liver, Crude, Glass, &c.* If of any effect doubtful; but serve to annoy the stomach and render the food unpalatable; good plain rubbing, clothing or exercise, better sudorifics.

AETHIOPS MINERAL. Of the same description. Proper dieting, exercise judiciously managed, much more efficient, I believe.

HUMAN NARCOTICS, *not affecting horses in a corresponding degree.*

OPIUM. To an old horse, at the Veterinary College in 1792, unprepared by previous small doses, I gave two ounces of opium: three hours after I went to see him; his respiration was rather increased; his pulse not full but quick; his eye staring: when I approached him unseen, and suddenly he started; his pulse towards night was 70 and strong: the next morning, full, strong, and slower. These were all the effects I observed. The opium was here beat soft and mixed with the meal, that it might the sooner dissolve, and produce its effects at once on the stomach.

Two ounces were given to another horse, and produced the same effects in a more sensible degree. I must again here emphatically remark, that when the animal is in a state of debility, as after inflammatory attacks, severe purging, bleeding, or other evacuations, he cannot withstand its action; but the whole system, especially the alimentary canal, rushes into a most violent and fatal inflammation; and the carcase opened after death, has a peculiarly strong offensive smell. My friend William Moorcroft, informed me he gave a horse one ounce of opium every two hours, in a case of locked jaw, without destroying the animal. That their resistance to its effects is truly remarkable; and the more so as the gentle stimulus of oats produces with them almost the exhilaration of wine.

ALCOHOL.

Large quantities of brandy, or spirit of any kind, appear also only to stupify them, but do not induce real drunkenness as far as I have ever seen, and I have pushed it as far as three pints, and two bottles.

TOBACCO.

Two ounces of Virginia tobacco was beat with a little water and meal into two balls and administered to an old emaciated horse; but produced no effect that was visible. The next day four ounces were given him; observed five hours after, no effect was produced, except that the respiration appeared rather quickened. In the morning I examined him before the grooms were in the stable, found his dung a little moister and slimy, his pulse equal, 49, a great discharge of mucus from the nostrils, thick, semi-transparent, streaked with white lines. I observed no other effects.

MEDICO-DIETETICS.

To make a Bran Mash.

Take of bran or pollard the quantity intended to be given, as half a peck, put it into a bucket, and pour upon it scalding water enough to thoroughly wet it; let it be well stirred with a stick, or squeezed with the hands, and stand covered over, till of the temperature of new milk, or quite cold, if so required. If it is desirable to render it more nutritious, oats may be added, or malt, or treacle, or honey.

A Malt Mash.

In the same way, using malt for bran.

Blanch Water.

Take three or four handfuls of bran, wet it with scalding water enough that it may be squeezed and worked with the hands till it becomes clammy, then add as much

water as may be desired. It is useful in cases of inflamed lungs or bowels, and with purging physic, as being more soft, bland, and suitable than mere water.

Oatmeal Gruel.

For a gallon take half a pint of good fresh Oatmeal, put it into a beechen bowl, to it add half a pint of water, rub them well together with a heavy wooden pestle for a considerable time: this I have found by many trials, and much experience is necessary to a perfect union of one of the constituents of the Oatmeal with the water, and which simple boiling does not appear to effect, even though long continued, and which does no good to the quality of the gruel; by trituration also, a less quantity of Oatmeal will make as rich or richer gruel than a larger quantity and longer boiling, and certainly much more palatable. At one period of my life I used it for my own supper every night for years, and discovered the advantages of trituration during the course of this practice; for, with a little milk added, it makes a delicious repast, being poured over some new bread pulled in pieces into a bason with a little brown sugar. A table spoonful of good Oatmeal is sufficient for nearly a pint of gruel when trituration is used; and there is no occasion for boiling it, for, when it simmers, it thickens and becomes very rich, and poured boiling over the bread, reduces it to a sort of candy, especially if it be new. The utility of this to invalids, and those who wish for light suppers, has made me thus minutely particularize its preparation, having myself experienced the advantages of it. To make it more delicate and light of digestion, the coarse branny part of the oatmeal should be separated from it, not by straining it, but by subsidence during a few seconds of repose, after all the water has been added in the bowl, which can be poured into the saucepan without it; as soon as it begins to boil it thickens, so as to drop from the spoon without any noise, which is the criterion of its having acquired the due consistence. If it be made entirely with milk, it is too strong and heavy of digestion, but with about one-fifth milk and the rest water, it is light and very palatable.

For horses, thin gruel only is in general wanted, as a diluent; those who make it so thick and rich forget that they are giving them what would be almost as strong and inflammatory as so much oats. I would caution them also against another thing, which is the distending the horse's stomach when in a state of weakness, and want of digestive power, by forcing down with a horn more than they can conveniently digest, although under some circumstances a horn full or two may be administered in this way usefully, yet what he takes of his own accord, will ever serve him best, and it should be presented to him assiduously, where the appetite is delicate; if they disrelish one thing, another should be tried, and even water alone, if they are averse to gruel and such kind of things, which some are, and cold water if given in small quantities and often, if they dislike it warm, rather than omit it; and hand-feeding also, often induces them to feed and pick a little, when no other means will, if nutrition seems necessary, which, in inflammatory complaints, is not so much the case as many apprehend.

MEDICINE.

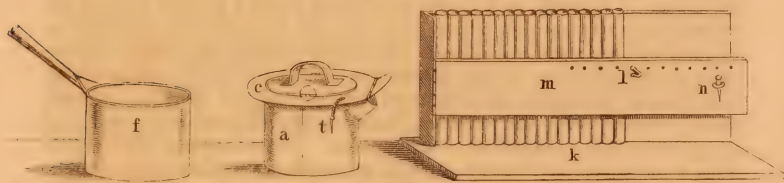
PURGING BALLS.

As purging physic with horses is the most useful and important of any, and nearly all indeed that really is wanted, and the *aloes* being the best for this purpose, so I shall describe a new and very convenient method for managing this useful extract. This invaluable medicine is the produce of the *Aloe spicata*, *perfoliata*, *vulgaris*, and other species of this genus, it being the juice of the thick leaves of this plant inspissated by boiling down. Being a gum resin, it is with considerable difficulty made into balls of a good consistence, by beating in a mortar, being either too solid, or too soft and deliquescent, though using, as we formerly did, alkali or soft soap for this purpose. This desirable object I attained completely by mixing it with treacle, and casting it in paper tubes: the simple apparatus I use, is represented in the annexed engraving, as it appears now after many successive improvements:—*a*, is a tin pot with a lid and a low handle on it, that the lid of the saucepan may go over and cover it, into which the aloes is thrown, broken into small pieces. This pot has rather a wide spout, with a valve at its extremity, suspended by a loose hinge, which dropping down, falls upon the stream of flowing aloes, and serves to keep the cool air from it, which, without this precaution would set and coagulate it, and which much embarrassed me in my first attempts; before the entrance of the spout, and within the pot, is placed a wire grate about four inches square, to prevent pieces of gourd and other foreign matters from choking it up. The lid opens by a hinge, and the other side of it is fastened by a pin, *t*, suspended by a small chain: *f*, a common kitchen saucepan used for a water or steam bath, the flange, *c*, of the aloes pot resting on the edge of it, and into which it is put, and then placed over the fire. Good aloes being selected, smooth and shining, with as little sand, and dirt, or gourd, as may be, or burnt to a friable state, as sometimes is the case; to any given quantity of this, add one-fifth by weight of treacle, and place it over the fire; in an hour or more, by keeping the water boiling, the aloes is brought to a fluid state, without any danger of its burning, or boiling over, and now and then in the course of this process, but not too often, the lid may be removed, and it may be stirred with a spatula to combine more effectually the treacle with the aloes. When perfectly reduced to a fluid state, the pot is taken out of the saucepan, and it should be as expeditiously as possible cast into the tubes of paper, and as in cooling it contracts and sinks considerably, they are again to be filled up. The consistence of these rolls when cold, will be found excellent, being solid for handling, yet flexible. The balls are readily formed by simply cutting these rolls into pieces of any length with a buttered knife. An ounce weight is a full and sufficient dose for a large sized saddle horse, or coach horse, if the aloes be good; and ten drams for a cart horse, diminishing the quantity in proportion to the size of the animal. The aloes at present

being less adulterated than formerly, a less dose will be sufficient. At *k*, is a convenient stand for placing the paper pipes in; *m*, a door opening with a hinge to secure them; *n*, a staple and nail to fasten it; *l*, a wire to support the pipes of paper, with holes to accommodate any number of them, or they may be simply stuck upright in a cylindrical gallipot, or be placed in bran, or meal.

To make these paper tubes suitably, they should not be formed of hard or stiff paper on account of the throat of the horse: printer's paper, without gum, serves well for this purpose. These tubes are formed by pasting one of the edges, and then rolling them over a cylindrical stick, and to prevent embarrassment from the paste coming in contact with the stick and hindering its being drawn out, the pieces of paper should be cut wide enough, as one circumference and a half, half of the latter serving for paste, and the rest for overplus. Lay these papers tile-fashion, one over another, exposing the edges to be pasted, and one end also extending a little beyond the stick, which is afterwards folded and neatly closed by means of the stick pressed upon the table.

New Apparatus for Casting Balls of Aloes.



It is true also that the aloes and treacle may be simply united by melting in a pipkin, and when cold the doses may be cut out as they are wanted, with a knife or spatula, but where many are wanted, the tubes will be found most convenient.

It may not be improper to state here, that as far as my experience goes, it has not appeared necessary to add to the aloes any aromatic substance or spice as is often done; for during thirty years that I have administered it simply in the formula just given, I never knew a single case of its griping the horse, though I have known it to do so in other hands, where these things have been added; that I believe it is the more likely to do it from such additions, and simplicity of formula is, if nothing forbids it, ever best.

We may remark, that a large dose of the aloes is requisite to operate effectually on the horse, which arises perhaps from the little share of irritability of his stomach and bowels, and which dose produces an extraordinary languor and debility for a day or two after, as will be seen if they are much worked or ridden; the vast relative magnitude of their intestinal canal, and the strong sympathy of the whole system with this part, will sufficiently, we believe, account for this effect.

It is also singular, that a PURGING DRINK, or DRENCH rather, is almost or quite a desideratum in horse medicine, though often pretended to be given by the farriers; for the aloes, the only proper purgative of the horse, is of so resinous a nature, that it is with difficulty miscible with water, at least such was the case a few years ago, from the large proportion of common resin with which nearly all the aloes of commerce was adulterated; but the exposure this has had of late, has much contributed to the rectifying this abuse, and now we get it tolerably free from this adulteration.

In order to form a drink, I found by first uniting it with treacle, this difficulty was in some degree overcome, but if much water is added, a separation of the resin takes place. Another way of accomplishing a better union, is by well rubbing down the aloes with blanched almonds in a mortar, pouring upon it warm water. The mucilage and oil of the almonds, appear to render it miscible for a considerable period. In some cases, as in strangles, where the throat is much affected and tender, and where the giving of a ball would be inconvenient, the utility of such a drink would be considerable.

It was a matter of curiosity with me to know the real proportions of gum and resin, and of fecula, in a pound of the best Barbadoes aloes that could be procured in the market; and I requested, as a favour, my esteemed friend I. T. Barry, to make the analysis, in his very ingenious vacuum apparatus, and the result was as follows:—Eleven ounces and a half of the *Gum* or *extract* soluble in water after cooling, and one ounce and five-eighths of *Resinous* matter, that became deposited by cooling having been brought into solution by the previous heating, there was also some vegetable fecula, left undissolved, and which was found to weigh about five drams, the rest of the pound was lost or wasted about the apparatus. About one gallon and a half of water was employed, and the inspissation of the solution as we have stated, was performed *in vacuo*. It should also be remarked, that a portion of resinous matter would still remain with the aqueous extract, being held in solution through the medium of the gum, that the exact quantity of resin cannot be perfectly known by these means, but near enough for our present purpose.

Some have proposed to remove the resinous part of the aloes, previous to its exhibition, but this we think a needless trouble, since the aloes, when combined with treacle, has never, as far as forty years experience of it, by myself, and nearly as extensive a trial by several of my friends, been known to gripe a horse, therefore, why, for an imaginary evil, so laborious and expensive a proceeding. If the resin, given alone, should be found, by experiment, which we are not acquainted has ever been made, to gripe a horse, there is from this no reason to suppose it would do so when combined with its native gum, and with treacle also. That we would, by no means, recommend so troublesome and gratuitous a proceeding. In order to detect sophisticated aloes, such a proceeding however might be found highly useful.

There is also in the markets, commonly at this time, another article of this sort, called *Cape Aloes*, as coming from the Cape of Good Hope; very light, shining, and exceedingly brittle. It will dissolve nine-tenths of it in hot water, first being finely powdered in a mortar; the remaining tenth seems to be resin. On standing to cool a fecula subsides

of about one-eighth, and on standing longer at rest, there was nearly a general deposit, which slowly falls in about six hours, so that it is to be considered rather as a mechanical suspension than as a solution. This deposit, after seven or eight hours, formed at the bottom of the vessel a cohesive glutinous mass, of a shining resinous surface and appearance, and which probably was a mixture of both gum and resin. It is cheaper than the former, but it is found to require a much larger dose of this kind of aloes, to purge a horse, than of the Barbadoes, and it is also generally considered as obtained from a much more heterogeneous mixture of plants.*

Having finished my observations on the physic of horses, there is a circumstance worthy of remark, which I have observed, after several times administering it, in respect to dogs; that the aloes does not appear to act in a dose at all proportionate to the size of the animal if at all. For them the syrup of buckthorn is much used, (*Rhamnus catharticus*) but in the shops is often sold a sophisticated article of treacle and jalap for it, so that people must be cautious in drawing conclusions in this respect.† Tin filings, or pewter scraped, is given by some to dogs for this purpose, which must operate, one should suppose, not by any medical, but mechanical effects, as a very rough conficator of the bowels. The proper purging of the dog seems in some obscurity at present, as are also the causes of the different nature of his alvine discharges, differing so much at different seasons. The white dogs-dung is never given, I find, but when they have eaten bones. Two table spoonfuls of the genuine syrup of buckthorn from Apothecaries Hall, was given to my pug dog, (weighing about 16 pounds) it did not purge him. Treacle would be better than refined sugar, and the spices might be better left out, as ordered in the human Pharmacopœia.

ON DIURETICS.

NEXT to purgative medicines for horses, those are the most useful which affect the urinary organs; irritating these organs will sometimes remove small inflammatory affections in a similar way to Purgatives, and as they can be resorted to without much

* It may not be without its use, just to state here, that my nephew Charles Clark has informed me that in two or three cases of inflamed lungs that he had lately been called in to, where some farriers had been previously employed, he was prevented from rendering any useful assistance, by these men having administered large quantities of common oil, pretending to the owners of the horse, that it was castor oil; this to the horse, dreadfully nauseous and indigestible mass, remained unchanged on the stomach to the very last, and prevented the operation of any medicine that was given, or even the salutary operation of the food or diet that he prescribed for them. And at last on the death of the animal, this greasy mess to the amount of nearly two quarts, was found floating about in the stomach unchanged. And he found he could do no sort of good where this abominable practice had been pursued. In one case a quantity of Glauber's Salts had been also administered along with it. We hope this announcement may prevent the repetition of such a wretched course of treatment. Probably warned against large doses of purgative physic to avoid that Scylla they fell into this Charybdis.

† In Worcestershire, near Malvern Hills, but especially in Essex, I have observed this plant growing abundantly in the hedges, which I mention, in order to give an opportunity to those who may be disposed to try its genuine effects.

debilitating the animal, or rendering him unfit for service, so are they often employed. I may specify that in the grease more particularly, I think I have seen advantages from their use, and I believe in some cases of farcy also; but by far the greatest number of balls of this kind have been administered, not with a genuine view to medicine, but to serve the interested purposes of grooms and smiths, and much more is said by these men respecting the imagined suppression of urine, and the necessity of provoking this evacuation than at all exists.

Resins, and turpentine, and essential oils, readily move the urinary organs of this animal to secretion; but before the prescription is given for this purpose it seems proper to consider a little the nature of the augment used for this, and for balls in general; by augment I understand the vehicle of the medicines, and which constitutes the chief bulk of the ball, for the medicines alone, it is obvious, would not make a ball of any size or consistence; in books, we often find people hastily recommending what they never tried, or could reduce to practice. Instead of linseed meal so generally recommended, for an augment to horse-balls, I find a much better thing, is bean flour, for adhesiveness, and giving them tough consistence, and still more easily obtained, and as good, is malt dust, or oatmeal; and still preferable to these, as being more easily obtained, is barley meal. It should be sifted through a sieve not very fine, and the bran and coarse stuff be separated from it. Liquorice-powder is often recommended also for this purpose; but when genuine is very expensive, and is therefore generally very much adulterated and so mixed with other powders by the drug-grinders, and venders of drugs, that you know not what you are really giving. The bad cohesion of the linseed meal, arises, I apprehend, from detached particles of oil, remaining in the cake after pressure.

The following prescription for these balls, I believe to be as good as any, and I speak it from actual experience.

URINE BALL.

<i>Nitre, or the Nitrate of Potash</i>	one pound,
<i>Castile Soap</i>	half pound,
<i>Common Turpentine</i>	one pound,
<i>Barley Meal</i>	two pounds and half, or sufficient to

give them a good consistence: pulverise the nitre, and pound these ingredients well together in a mortar till they cohere and form a tough mass through the viscidness of the turpentine; then divide it into balls of a moderate size, as of an ounce weight, increasing or diminishing this quantity, according to the size of the horse. By liquefying the turpentine at the fire, the process is rendered somewhat easier. And, if a strong smell is desired, and some will have no opinion of these balls without it, two drams of the oil of *Juniper*, or the same quantity of the essential oil of *Aniseed*, may be added to the mass, without any incongruity. And in order to render these balls perfectly cylindrical and handsome, they should, after a little rolling on a board or marble slab dusted with meal, be put into a cylindrical tube made of tin, and with a stamper of wood, be rammed to the exact figure of the tube; an oval form given to

the ball, is, however, I am disposed to believe, the best for administration as more easily passing the horse's throat; if meant for long keeping, let soft soap be substituted for hard. *move out with ash*

To form a URINE DRINK is also not difficult, since *Nitre*, *Glauber's Salt*, and *Sweet Spirits of Nitre*, all act on the kidneys of the horse, as do also the turpentine, and the essential oils, rendered miscible with water, through alkalis, soap, or mucilage. The following is perhaps, well suited to this end.

SALINE URINE DRINK.

Glauber's Salts.....two ounces

Nitresix drams. Dissolve in one pint of warm Water,
and add of Sweet Spirits of Nitre, one dram by measure, and give with a horn.

It is the custom to use the large end of the horn for this purpose; I reverse this, and close the large end with a piece of wood, cemented into it, then cutting off the small end, so as to afford an opening of about one inch and a half diameter, I fit this with a good cork; in this way it can be introduced farther into the mouth, along the cheeks, and towards the throat, than the large end, and it is then less tasted, and liable to be rejected; and in case of carrying it to a distance, especially on horseback, its very great convenience must be obvious in the stead of a glass bottle. Where disguise is necessary, as is sometimes the case with the practitioner, these drinks may be coloured by keeping ready prepared a strong infusion or decoction of Alkanet Root, Turmeric, or Red Sanders, prevented from putrefaction, by the addition of a small quantity of Spirits of Wine. Another description of urine drink, as they are now affectingly called, or rather drench, is the following, which I call for distinction the Warm Urine Drink.

WARM URINE -DRINK.

Best Turpentine.....half an ounce,

Spanish Soap, cut thinthree drams,

Potashten grains,

Oil of Juniper.....half a dram, or thirty drops,

Rub them well together in a warm Mortar, and add a pint of warm Water to form the Drink.

To render our empire over these brave and inoffensive animals, as little disgusting as possible, I would recommend to the enlightened practitioner to abstain from medicines as much as he can, or to contrive such as can be readily given with their food; where however from nausea it becomes necessary, these medicines must be administered in one or other of the above ways.

In respect to the two evacuations by the intestines and the kidneys, our knowledge is pretty clear and certain; but beyond these I apprehend we are wandering on very uncertain ground; and though prescriptions may be multiplied to make up books for the purposes of booksellers, or to give to the ignorant an air of extensive knowledge in these things, or of dexterity in prescribing, yet their precise effects we do not, or probably ever shall know much about; and let those who confidently think they know,

beware that they have not been led into delusion, or false conclusions, which time, more correct knowledge, and exact observation, will expose; I allude particularly to mercurials and alteratives. Let me recommend also that the young practitioner should observe the greatest simplicity in his formula, as inference will then be less exposed to error, and complex farragoes, and minute things, only expose the ignorance of their proposer.

ON STIMULANT AND TONIC MEDICINES.

The *Cordial* and *Tonic Medicines* appear to divide into four kinds or orders: as the *Alcoholic* or *Spirituos*; the *Spicy*; the *Bitter*; and the *Metallic*; and some of the *Narcotics*, though falling in some respects into this order are excluded for the present.

The Tonics appear to have the power of giving additional tone to the relaxed and weakened fibre, and to call up an increase of its energy and power: the Spices do this without so much subsequent depression; the Spirituous exhaust more; the Metallic appear to produce these effects best when combined with oxygen, and perhaps, other gaseous bases, since the metal by itself would hardly have any sensible effect. Iron even in minute doses appears a powerful tonic, as the Bath waters evince; which instead of being relaxing as common warm water would prove, are rendered highly exciting, and tonic, and stimulant, by this minute portion of iron. Unless we allow the high temperature of the water itself that gives to it these effects, or essentially so aid them, which water moderately warm would not so well do. Internally given, these metallic salts are most of them strong emetics to us, and also to most other animals, but not so with the horse.

Not only the *Sulphat of Iron* and the *Sulphat of Copper*, but the *Sulphat of Zinc*, *White Vitriol*, is also possessed very strongly of these tonic properties, though their proper dose remains very much a desideratum; for when their effects are rendered externally visible, then it is their poisonous effects only, not producing increase of tone but real distress, that to draw satisfactory conclusions in these cases is truly difficult, though the numerous prescribers of horse medicine find no difficulty in this respect. One thing is certain, very small doses operate best.

In cases of debility from excess of labour or of food, their tonic effects will be found most beneficial, as in Farcy Cases more particularly, where the stomach and *Chylopoietic* system have suffered, they may be of the greatest use in calling up more vigor to the digestive organs; any inflammatory symptoms that appear in these cases, being first subdued, by a bleeding or a rowel; and we may increase and improve their effects by *due exercise, good air, well grooming, and wholesome food*, administered frequently, and in small quantities. The *Sulphat of Zinc*, is also a most invaluable medicine, externally applied as a general dessicative, and in producing adhesion of the sides or surfaces of old abscesses and parts becoming inert, drying up discharges, &c. of which I shall adduce some striking instances from my own practice in its proper place, for in this place we are considering internal medicines only.

The *Ægyptiacum*, or *Oxymellate of Copper*,* may also be classed along with these,

* A useful formula, and cheaper than the common one of Verdegriis and Honey, will be given further on.

and I am led to believe might be made to serve almost every purpose, both of external and internal administration to these animals, and render unnecessary nearly all the others; though it will be difficult to ascertain the precise dose of it, which can only be done by a long and sedulous attention to a great variety of cases.

I shall now give a few formulas, observing the above order.

SPIRITUOUS DRINK.

If spirits alone are given, a wine glass in half a pint of water, it is presumed, would be a proper dose, and of ale, about a pint.

SPICY STIMULANTS.

In respect to *Cordial Balls* for horses, which are words of very fascinating sound with grooms and stablemen, and under this pretence, have horses very often been dosed with drugs and rubbish, containing nothing cordial in them: one farrier told me he made all his *Cordial Balls* of Brimstone! and the refuse of Druggists' Warehouses is often sold to these men for this purpose.

Our notions respecting these stimulants are wholly derived from the feelings of our own stomachs, and what is aromatic and spicy to us, we conceive as spicy to them, and this may not be very untrue, though there is less analogy between the stomach of the horse and the human perhaps, than almost any two stomachs among animals. The stimulus of Spirits, of Wine, or of Opium, is not in many respects the same to them as to us, nor is oats or barley so exhilarating and stimulant to us as to them, so that our conclusions in this respect may not be perfectly correct; and in the metallic Salts also of every kind, and the vegetable emetics, we have no analogy whatever.

In the Gripes, I first used the Pimento as being preferable to the other spices, for cheapness and aromatic excellence, and its effect in curing that disorder would seem to prove its goodness for this purpose, and therefore I made of this my *Cordial Balls*. The following is the *formula* I recommend.

CORDIAL BALLS.

Pimento Berry, finely powdered or groundone pound,
Barley Meal, siftedtwo pounds,
Treacle or Honey, a sufficient quantity to make it into balls.

If more vigorous stimulation should be thought necessary, powdered *Ginger* or *Cinnamon* may be added; or if a very high degree of stimulating effect should be wished, *White Pepper*, or *Kyan*, might be used. A useful Cordial Drink is also readily made in the following way; to which Spirits, Brandy, Wine, Ale, or Porter, can be added, if thought requisite, instead of water.

CORDIAL DRINK.

Gripe Tincturefour ounces by measure,
Warm Watereight ounces by measure.

For interested purposes, what are called *Cordial Balls*, are often administered to

horses, and after a long fatiguing journey it is said they are more particularly serviceable; but I should apprehend from what I know of the constitution of the animal, that a good warm mash of sweet new bran, or malt, would be a greater indulgence in such a case, with a good bed to repose on; or the milk gruel before described, made rich and sweetened with honey or treacle; and if he dislikes it not, a little warm ale might be added, which would be preferable, and of more service than all the drugs in the world.

SPIRITUOUS DRINK WITH SPICES.

I introduce here, on account of its great utility, the *Gripe Tincture*, as strictly belonging to this place and class of Medicines, which I discovered some years ago, and used as a valuable secret; and it has been in my hands and of many others a most useful medicine, saving numberless valuable horses from death, scarcely ever failing in its effect, if duly administered, as several of the large Breweries of this Metropolis can testify. The prescription for the *Gripe Tincture* in that work, p. 10, is as follows: where the causes of this fatal complaint are also shewn.

Take Pimento Berry, ground fine.....one pound,
Spirits of Wine and of Water, eachthree pints.

Let these infuse together several days, occasionally agitating the vessel, and then be strained off for use. About a quarter of a pint is a dose, given as early as possible on the seizure, and it should therefore be always kept in the stable in readiness by the groom or horse-keeper, and the administration of it is not by a single dose and then leaving the animal to his fate, but it is to be administered every hour till relief is obtained, using warm clothing, and, in bad cases, hand rubbing of the abdomen with a flannel glove, if possible, without removing the coverings: in this way, its effect, even in cases the most violent and protracted, if mortification has not actually taken place, is almost certain.

Some imprudent, not to say imprudent practitioners, unprovided perhaps with the *Gripe Tincture*, have hastily substituted the *Spirits of Turpentine* for it, which being of not so digestible a quality, and of more violent effects, has occasioned I believe the intromission of the bowels, and loss of the horse.

INJURIOUS EFFECTS OF SPIRITS OF TURPENTINE.

For the *Spirits of Turpentine* is quite another description of stimulus of the stomach, whether of a nature so well suited or beneficial as spices and wines I should doubt; but the following account from a careful experiment of a large dose of it upon the horse's stomach is particularly worth recording; it was taken from my minute book of cases, and the experiment was made in consequence of a Veterinarian asserting in a communication sent to the Society of Arts, Manufactures, and Commerce, that he had found out a cure for all worms of horses, and that it consisted in giving no less a dose than four ounces of this acrimonious spirit in gruel. The Committee investigating this matter, requested me to repeat the experiment and carefully watch the result of

it; and the following were the effects and appearances on opening the horse after death, and also to see if there were actually worms for it to act upon. No doubt the credit this spirit had got for curing the *Tenia* made this Veterinarian suppose it must kill all the other species too of intestinal worms, and then assert it as a fact; but we may remark that the *Tenia*, or tape worm, though common in dogs, and not unfrequent in the human, is truly rare with horses, that unless positive proof exists of its presence, by pieces coming away, it is not worth fishing for at random by such intolerable measures.*

* I proceeded April 11, 1817, in company with another person also deputed with me to make the experiment, to give a mare at the slaughter-house four ounces of Spirits of Turpentine in a pint of thick warm gruel. She was a chesnut mare, about fourteen hands high: we selected for this purpose one that had upon the fundament a considerable quantity of that white matter which is noticeable in such cases, and which indicates, I have observed, the presence of that particular worm, I have called for distinction, the Whip Worm, being in figure like a hand-whip, or dog-whip, that is, large at the handle part, and tapering to a fine point at the other extremity.

After it was administered I watched her for twenty minutes, then left her, and saw her again at the end of two hours, leaving my apprentice with her during my absence. I found her on my return lying down on her side, and I thought with a look expressive of pain; and the slaughter-house people said she had looked a good deal towards her flanks, as horses do when they have pains in the abdomen.

The next morning I sent at six o'clock to examine her dung; a solitary worm or two were found, but not more; which I should not apprehend had much to do with the medicine. About ten o'clock I visited her myself, but could find no worms, though I examined her dung made during the night, minutely. I let her remain alive till the next morning, forty-eight hours after the medicine, that it might have its full effects.

I then attended again at the slaughter-house, and had her knocked down with the pole-axe. Being dead I proceeded with the assistance of the slaughter-house men to open her, and taking out the bowels and stomach, beginning at the *rectum*, a ball of dung was found in every pouch of this gut for three or four feet from the *anus*; and outside the balls, lying in contact with the lining of the intestine, were several of the worms of the species I have called the Whip Worm, from its figure being like that of a dog whip, that we may not confound this species with the big *Lumbricus*, or the small *Ascarides*.* Some of these Whip Worms I observed dead, their skins filled with the white matter which soils the extremity of the *anus*: so that the way in which this curious appearance takes place is, not the excrement of these worms as was before apprehended, but that the dung in its exit, squeezing the tender skins of these dead animals, bursts them, and this white matter falls upon the *perineum*; many hundreds of minute young ones were also found lodging in the mucous lining of the intestines, apparently very newly born; they appeared as did the old ones, alive and hearty, and therefore not affected by the medicine.

Through the whole course of the *rectum* these worms were found; but none in the *water gut*, which is the next to it; again, in the *colon* they were found in great numbers, and appeared to be alive; also in the small intestines; but in the *duodenum*, there were none, which is a bad name in the horse, as it has more than twelve inches of length.

I was now curious to open the stomach, and it afforded indeed interesting matter of reflection; two species of bots were most fortunately found in it, the *Equi*, and the *Salutiferus*, or new species, of which I published an account last year; they were neither of them dead, or even at all hurt by the medicine, but were particularly lively. The *Salutiferus* I found in a distinct cluster at the entrance of the *duodenum*, confirming my suspicions that that was its real natural habitation, just out of the stomach. These animals, I may just inform the Society, are not the offensive and destroying demons that ignorance had painted them; but nicer enquiries than ever were made before, have led me to consider them as stimulants to the stomach, or as the pepper and salt of horses' stomachs: having brought with me a Treatise respecting them, I beg leave to present it to this useful and honourable Society.

I next proceeded to examine the stomach itself, and found that its red part was highly inflamed generally,

* It has lately received the name of *Tricocephalus Equi*.

Of the bitters, Quassia, or Gentian, appear the best suited to the purpose; the following formula I would recommend of this medicine.

BITTER DRINK.

Quassia Chips.....two ounces,

Waterthree Pints, boil till reduced to Two

Pints, for Three Drinks; one every Morning, with any Spice, or other addition the case may appear to require.

BITTER DRINK WITH SPICES.

Quassia Chips.....one ounce,

Ginger.....two drams,

Watertwo pints; let them boil ten minutes,
then strain off for two Drinks.

METALLIC TONIC DRINK.

If white vitriol should be preferred, or is more easily procured, the following formula may be used.

Sulphat of Zinc.....half a dram,

Ginger or Pimento, groundone dram,

Treacleone ounce,

Water.....twelve ounces.

Mix the treacle with the powders, and rub them together; then add the water. To these, brandy or other spirits may be added, if thought necessary.

EGYPTIAC TONIC DRINK.

Of Ægyptiacum, or Oxy mellate of Copperhalf an ounce,

Pimento or Ginger, powderedhalf dram,

Water, twelve ounces, or enough to form a moderate drink.

Of excellent effect have I seen the following in Farcy Nasal Gleet, suppressing the discharge in a remarkable manner.*

and in some places blistered, a thing I never saw before; blisters from the size of sixpence to half a crown were seen in various parts of it, which must have given the animal great suffering. "From these facts one should be ready to conclude, that the gentleman who applied to the Society for a reward, had rather hastily drawn his conclusions, without the experiments necessary, taking for granted what has been asserted in respect to the human, for the medicine it is evident from its effects upon the stomach, was here carried as far as it prudently ought."

I have recorded this experiment as it is rather a painful one, in order to prevent, in some degree, the needless repetition of it, at least too often; for where an effect is ascertained and fully known, it is no longer an experiment, though often falsely called so; with inanimate matter this is not of much consequence, but certainly it is quite otherwise with sentient beings.

* I have last year, 1823, seen a cart-horse so glandered he could not be sold for two pounds in Birmingham fair, cured in five weeks' steady administration of this medicine, and the tonic medicine alternately, week by week, by my recommendation, and become worth forty pounds, that he went to his work again at the Eagle Foundry, and remained sound though hard-worked, in drawing heavy loads of cast metal. Another case of a black fine chaise horse of Sir Charles Price was cured by James Beeson, in six weeks, by the steady administration of these medicines, in the same manner, to his great surprise; indeed the effect is truly remarkable, and worthy the attention of Veterinarians. Let me not by silence, however, be guilty of not rendering justice to its discoverer; for though I was the first that ever tried it in these cases, I owe the suggestion to the ingenious Dr. Robertson.

CANTHARIDES TONIC DRINK.

<i>Rj. Zinci Sulphas</i>	<i>.....fifteen grains,</i>
<i>Pulv. Cantharides.....</i>	<i>.....seven grains,</i>
<i>Pulv. Pimento</i>	<i>.....fifteen grains,</i>
<i>Theriaca, or Treacle.....</i>	<i>.....one ounce,</i>
<i>Aq. pur. q. s. ft. Potio cornu digerenda.</i>	

Or, if a ball is thought more convenient, I recommend the following formula :

<i>Rj. Pulv. Cantharides.....</i>	<i>.....gr. vii.</i>
<i>Zingib seu Pimento.....</i>	<i>.....— xv.</i>
<i>Hordei seu Avenæ pollinis q. s. cum Theriad globum seu offam conficiendum.</i>	

The Spices alone I have found without the Metallic Sulphats to have the happiest effects. The *Chincona*, or Bark, is also a Medicine possessing Tonic properties, and may be classed with these; its price however, and dubious effects, and quantity that would be necessary to be given, would seem a sufficient reason for not resorting to it.

There are stimuli also of the stomach of another description, and might be added at this place, which it may be difficult to class or give an appropriate name to; we shall call them *Adscititious*, or *Parasitic* stimuli, they act mechanically.

It may appear a new sort of medicine, and rather singular, but I am led to introduce them from seeing their effects, as it may lead to something useful hereafter, when their exact effects come to be known; I mean the larvæ, or grubs, producing the *œstrus* or bots, which appear to have the power of irritating the coats of the stomach, and of quickening the digestive action. These are but the native, or natural stimuli of the animal; they can nevertheless be artificially applied, and may be procured from the slaughter-houses for this purpose, and wrapped up in the skin of the stomach to which they adhere, or placed in balls of meal, be administered with the hand. I am led to believe, to sluggish stomachs, and especially when grass is their food, and low damp meadows their situation, they are a useful stimulus, irritating by their *spiculæ* or *Spines* to a quicker digestion, and so preventing gripes and other diseases, and may under some states of relaxed or torpid stomach, from previous over-stimulation, be found beneficial; at any rate, I choose not to omit them, but to bring them fairly upon the carpet of investigation.

For an experiment to ascertain their effects and to procure the flies from them, I once gave my little Waxy Stallion eighteen or twenty of the bots or larvæ of the *Oestrus Salutiferus*, and during the time he had them he was in as good or better condition than I had ever known him. In the summer months, these stimulants might be administered by means of their *ova* deposited on the hairs of the skin, and their operation would continue one twelvemonth, as they are *annuals*, or requiring eleven months for their full growth and re-production.*

* See a Treatise on these remarkable animals in the Linnean Society's Transactions, Vol. 3, and re-published by me, London, 1815, with Figures of them in all their states, and also those of the Cow and Sheep, &c.

FEVER DRINK.

Though I have before stated that pure or idiopathic, or typhus fever, is not found with the horse, at least, as far as my own observation extends, or of those practitioners on whom reliance can be placed, yet there are frequently high inflammatory actions, which are called fever, and which are to be reduced by the lancet chiefly:—in aid of these evacuations, drinks may be administered of the diluent and saline kind, provoking urine, and promoting free perspiration; to satisfy the bye-standers, such may be called *Fever Drinks*; the following I have used, and recommend:

<i>Nitre</i>	two drams,
<i>Tartarized Antimony</i>	half a dram,
<i>Warm Water or Thin Gruel</i>	twelve ounces.

This may be given once or twice in the day, and disguised if necessary, by the Tincture of Alkanet or Turmeric; for although this work is written for general purposes, it is more particularly intended for the use of the Veterinarian, and where confidence is inspired by such innocent means, there can be no impropriety whatever in the use of it.

Also *Acidulous Drinks* are not incompatible with the Therapeutics of this animal, assisting in lessening morbid action and heat; of these either the mineral or the vegetable acids may be used, about sixty drops of Oil of Vitriol to a quart of water, and enough of the alkali of Tartar added to leave it agreeably acidulous, or, if thought better, quite saturated, will afford an agreeable and useful saline drink at a little expence, and if a lemon, rind and all, be cut into it, and then strained from it, it would without much cost agreeably imitate the more expensive saline drinks of the human; a few drops of the *Ætherial* or Sweet Spirits of Nitre might be added as a diuretic and febrifuge, but in a general way, gruel variously medicated, will be sufficient.

FOR AN EXCESSIVE PURGING or DIARRHŒA.

A Diarrhœa, or violent Flux of the Intestines is often brought on in treating inflammatory complaints by the undue administration of Aloetic Purgatives, and very fatal has it often proved, occasioning apparently a Metastasis of the disorder to the Intestines. I found at length that it was best checked and arrested by the Neutral Salts. Diarrhœas also proceed from the want of biliary, and other secretions, which will be relieved by the following Drink I recommend as very valuable on such occasions.*

FLUX DRINK.

<i>Glauber Salts</i>	(<i>Sulphat of Soda</i>)	six ounces,
<i>Epsom Salt</i>	(<i>Sulphat of Magnesia</i>)	three ounces,
<i>Common Salt</i>	(<i>Muriat of Soda</i>)	half a dram,
<i>Green Vitriol</i>	(<i>Sulphat of Iron</i>).....	five grains.

Dissolve these in a quart of warm water, and make three drinks of it, one twice a-day; sometimes Prepared Chalk, a small portion, and sometimes a few drops only of Tincture of Opium, has been added.

* My friend J. Hall, Esq. has found it equally serviceable to cows, having a lax or scouring.

COUGH DRINK.

In cases of Cough, and even of Broken Wind, I have found the complaint greatly moderated and relieved by the following;—

Linseed Oil (cold-drawn).....two ounces.

Lixivium of Pure or Caustic Kaliforty drops.

Treacleone ounce.

Soft Water, ten ounces, shake them well together, and give to the animal fasting.

Coughs are also sometimes relieved by *stimulating the stomach* to a quicker digestion; and, on the contrary, are increased by foggy and musty food; *stomachic, bitter, and aromatic medicines*, therefore are to be used. *Blisters* to the Chest also are useful in chronic affections of this kind, and also rowels, for the same reason, by their counter irritations to the neighbouring parts.

COUGH or PECTORAL BALL.

Genuine Liquorice Root, in Powder.....half an ounce.

Linseed or Barley Meal, siftedone ounce.

Tarhalf a dram.

Honey, enough to make it into a Ball.

Bleeding however is chiefly to be depended upon in these cases. Attention to prevent all *drafts of air* in the stable, which, if rightly made, should ever be aired by its own loftiness, not by openings through it; this I cannot too forcibly enjoin to all who desire to have their stables healthy. *Bran tea, or blanch water, and infusions of emollient herbs*, are also to be recommended, as of *marshmallows, hyssop, &c.* plentifully bestowed and kept in a pail by night in the manger; powders of *gum tragacanth and nitre*, six parts of the former to one of the latter, may also be used in their mashes or in their food, kept ready mixed in the portable Pharmacy for these occasions, a table-spoonful being a proper dose.

Coughs also proceed very much from the absurd practise of washing horses, and of slopping them over the legs and thighs, and even carrying this wetting to the very abdomen, and this when they come in warm from work, or exercise.

My own horse, a bay chaise gelding, had a terrible deep hoarse cough when I bought him, but guessing whence it proceeded, I forbade him to be washed in this way, and it left him in about ten days, and never returned whilst in my possession. Nearly all the horses in the livery-stable where he stood were also coughing more or less from the same cause, and were relieved by my suggestion.

Let them be only dry rubbed when they come in from work, and be as well cleaned as a succession of soft whisks of hay, or of soft straw, or of coarse rugs, can make them; then leave them till the morning, or till perfectly cool, when they may be washed with safety, if thought necessary, being well rubbed dry after; for no animal formed of flesh and blood, but must sooner or later feel the consequences of such an absurd proceeding,

not only inducing coughing, but often grease and farey, and I have seen cases of founder, from chill thus induced. If, however, in any case such a measure of washing is rendered imperatively necessary, it should be done with the utmost celerity, and the parts be wiped perfectly dry and afterwards be well rubbed with a whisp.

WORM MEDICINES - - *Vermifugæ, Anthelminticæ.*

In respect to Worms in the Intestines, they are not easily destroyed, since they can refuse the food that does not suit them; for although we can force the poison down the horse's throat, we cannot force these to receive it. However, drastic purgatives will often bring away large quantities of them, though not with certainty. The spirits of turpentine seems a certain destroyer of the *Tænia*, or *tape-worm*. With less assurance is scammony and calomel recommended where there are *Ascarides*;* and the *Indian Pink*, *Spigelia Marylandica*,† for the *Teres*, or *large round worms* (*Ascaris lumbricoides*.) For the Bots, (*Oestri*) no medicine has ever been discovered that will at all affect them; perhaps some mechanical measures would be the best. "Oil to close the pores of respiration, and thus kill them, was a favourite suggestion of the last age, and it was "thought *must infallibly kill them*: nevertheless, it did not. These oils probably in "the stomach are soon reduced to a soap, and digested; how much less, then, could it "affect worms situated in the intestines."—See *Hist. of Bots*, p. 43.

In low cachectic habits, where these worms accumulate in great numbers, they seem to be a useful stimulus to the intestines, and by increasing their action, prevent worse disorders: the good which appears to attend their removal often, is to be attributed primarily perhaps to the purgatives used to remove them. The pretended destroying of worms is a fruitful source of profit to the grooms, and often by measures that are most injurious and ruinous to the animal.

The *scoria* or scales which fall from ignited iron at the forge, have been proposed as a medicine for horses, but not having watched its effects, I dare not prescribe it at random. Whether intended as a chalybeate or tonic, or rather as a rough conficator of the stomach and intestines, I know not, and I should be rather jealous of its forming those balls in the intestines which are called *Enterocalli*; the center of these bodies are generally seen with some heterogeneous substance, and especially those of the rectum, in which I have found more than once scales of iron.

OF POWDERS.

The advantage of Powders internally given, is, the great facility of their administration, being given with their food, or mixed in a mash of any kind, and therefore not requiring the disagreeable trouble of a drench or a ball. Their use is however very

* Perhaps a dram of each for the horse the over night, and a purgative of aloes the next morning will be the most suitable way, administering them in their provender.

† Perhaps a decoction of it, one ounce and a half of the herb to a pint of water boiled to twelve ounces, with a purge next morning.

limited, for nothing will horses take voluntarily that is unpalatable and offensive to them; and medicines generally are so, and therefore such are quite useless to be presented to them in this form. There is, however, another way of administering small doses of any very fine powder, which is, to scatter it on the tongue, partially drawn out of the mouth; and as the horse cannot very well spit it out, it will, by being entangled in the saliva, be gradually swallowed. Calomel, if thought useful, might be given in this way. The Cantharides, and metallic tonic powders, they will also take freely in their corn. The Antimonials, and Brimstone also, are frequently given them with their provender, to fine their coats, as they say. Liquorice Powder, Spices, and Salt, also appear among the chief articles that can be so administered.

NASAL GLEET POWDERS.

<i>Cantharides, finely powdered</i>	half an ounce.
<i>Sulphat of Zinc, ditto</i>	two drams.
<i>Pimento, ground fine</i>	one ounce.
<i>Barley or Oatmeal</i>	eight ounces.

Let a table spoonful be given every morning in Corn or Malt.

The stimulant power of these Medicines on the Stomach has a surprising effect in removing these disorders; and with half the quantity of Cantharides, they are an excellent Stomach Medicine in weak digestion, and hide-bound cases, with gentle laxatives occasionally.

TONIC BITTER POWDERS.

<i>Sulphat of Zinc</i>	five grains.
<i>Pulverized Gentian Root</i> ..	seven grains.
<i>Pimento</i>	a scruple.
<i>Oatmeal</i>	one dram, mix for one powder, to be given in wetted oats or malt.

PULVIS UTILIS.

Rj. Pulv. Rad. Curcumæ vulgo Turmeric, finely Powdered . half pound.

Oat Meal, Fig Dust, or Barley Meal sifted four pounds.

Mix them well and keep them for use. In forming a Drink or Powder, where patience is chiefly wanted, it comes in usefully, or to be used as a vehicle for other Medicines, in Drink, Powder, or Ball. The Curcuma is considerably aromatic, if we may be allowed to judge by the taste, and of an elegant rich colour.

CONDITION POWDERS.

<i>Crude Antimony</i>	four ounces.
<i>Flowers of Sulphur</i>	two ounces.
<i>Bean Flour, or Barley Meal</i>	half a pound. Mix for use.

A table spoonful in their corn is a proper dose.

Supposed to increase the cutaneous circulation, and to make the skin more pliant

and supple, and the hair to lay better and be more glossy. The hand, and brush, and currycomb, should however not be omitted, but be well applied in aid, with gentle sweating exercise. These medicines, however, rather belong to a subsequent chapter, on the *Hippocomia*, or the Dressing of Horses, as laid down in the Frontispiece.

CONDITION POWDERS WITH NITRE.

To the above add as much Nitre as Antimony, to increase the Urine.

See Art. Condition, at the end of this Pharmacopœia.

EXTERNAL APPLICATIONS.

SUEDIV.*—*To the Flesh, - - - - Sarcoteticæ.*

UNGENTUM DIGESTIVUM. Digestive Ointment.

A cheap and excellent digestive ointment is made by softening rosin with linseed or common oil.

Take Rosin, bruised.....one pound.

Linseed, or Genoa Olive Oil.....twelve ounces.

Place them over a slow fire till the rosin is perfectly dissolved. As a warm covering from the air, and of gently stimulant qualities, it is an invaluable digestive of Ulcers. When nearly healed, as an ointment of a more drying quality, Diachylon softened by double its bulk of oil will afford it.

ÆGYPTIACUM, or the OXYMELLATE of COPPER.

I have prepared this invaluable medicine for many years in the following way, and, as far as I ever could discover, found it equally or more efficacious than the more costly preparation of Verdegriis and honey of the human Pharmacopœia.

Blue Vitriol (Sulphat of Copper)twelve ounces.

Vinegar.....four ounces.

Treaclethree pounds.

Break the Crystals of Blue Vitriol small in a mortar, put them into an earthen pipkin—(an iron ladle will also do, but it is apt sometimes to turn the mixture black)—wetting the Salt first with the Vinegar, adding then the treacle; place it over a clear fire, and let it boil up the sides till the whole mass is inclined to rise, then take it from the fire, stir it a little, and let it stand near the fire till it has acquired a full red colour; when cold, pour it into a jar or small tub for use, using a wooden punch-ladle to take it out with, always stirring it previously, in order to mix the supernatant liquor with the subsiding oxyd; however when prepared as here directed, it is in general of a consistence that almost precludes subsidence.

This ancient and most valuable medicine, thus cheaply made, is useful internally as a tonic, and externally for healing chapped heels, running frushes, and for closing by adhesion of surfaces, old fistulous ulcers and abscesses, which it does much in the same manner as the Sulphat of Zinc, but is rather milder than that preparation.

DESICCATIVE POWDER, or *Pulvis Desiccativus*.

White Vitriol, or Sulphat of Zinc, ground fine

White Pepper

Chalk, lightly calcined, each equal parts, well rubbed together.

Any slight luxuriance of flesh may be reduced by using this Powder, with, or in some cases without compression; in general, however, the knife, and touching the mouths of the vessels lightly with the Cautery, is more to be depended upon, and perhaps on the whole less painful. The flesh of horses, if exposed to the air and neglected, especially about the limbs, is very apt to run into luxuriance, which requires both skill and care oftentimes to reduce.

This powder, diluted with an equal weight of flour, and enclosed in a canvass or other porous bag, is useful in dusting elevated flesh, in broken knee cases, or where digestion by ointments has been carried too far; though the air itself in most months of the year, if the fungus be exposed, is desiccative enough to dry, scab, and reduce them.

For the curing *Broken Knees*, see a short Dissertation at the end of this work. *The Surgery of Horses.*

AGGLUTINANTIA.

I add this for the first time as a distinct order, or class of medicines, from observing the powerful effects of the Sulphat of Zinc, in producing adhesions of the surfaces of living parts, and closing of old sinuses; the following are the proportions I have used for the solution. On account of these remarkable properties I have sometimes called it CONGLUTINUM.

Zinci Sulphasfour ounces.

Waterone pint, dissolved.

Several cases have occurred in my own practice, which will serve to illustrate its great utility and mode of application, however they will be more properly inserted in another place. *See Surgery of Horses.*

Vulneraries *Traumaticæ.*

TINCTURE MYRRH.

Gum Myrrh powderedtwo ounces.

Fine Washed Sand.....two ounces.

Spirits of Wine and Water each half a pint: mix and keep them together in a bottle, occasionally well shaking them.

In the same way, and same proportions, a Tincture may be made of Aloes, which is called *Tinctura Traumatica*, or *The Friar's Balsam*, or simply *Tincture of Aloes*.

These tinctures are considered useful applied to recent wounds, penetrating and slightly inflaming their edges and surfaces, and thus inducing a more speedy and firm union of the wound. The blood should not be removed too sedulously, as it is the only true bond of union; if, however, it occurs in clots or thick masses, from the wound gaping, it must be forced out by drawing the sides together, by sticking or pitch plaster; or if there be a more extensive division, by the needle and thread.

Div.***—*To the Skin.* *Dermateticæ.*

PLAIN BLISTER. *Vesicatorium.*

Powdered Cantharidesfour ounces.
Lard, Olive Oil, or Horse Oiltwo pounds.
Oil of Origanumtwo drams.

Mix well together, and let the Ointment be a little warmed when applied, and rubbed in well for eight or ten minutes to the part; especially useful for old strains and for thickenings of bone or of membranes.

STRONG BLISTER. *Vesicatorium forte.*

Powdered Cantharidesfour ounces.
Spirit Turpentinethree ounces.
Pulv. Gum Euphorb.two drams.
Lard or Oiltwo pounds.
Oil Origanumtwo drams.

To be used more especially for the chest or abdomen, in inflamed lungs or intestines, or about the pole in affections of the head.

MOIST WARM BLISTER. *Vesicatorium molle.*

Common Rosinsix drams.
Linseed Oilhalf a pound,—let the Rosin dissolve by applying warmth, and add
Cantharides, finely pulv. six drams.
Lardtwelve ounces.
Oil of Origanumtwo drams, mix them intimately.

The Linseed Oil and Rosin appear to have the effect of keeping the Ointment moist and soft or liquid for some days after it is applied, and of thus permitting the rising of larger vesications. The Tincture of Cantharides also will blister, but I have found the above prescription answer so well every purpose desired, that I have never used it: Simple Olive Oil and Cantharides will also blister very well; indeed the skin of the horse is remarkably susceptible of Vesication. For a Dissertation on Blistering and Firing—see Rees' Cyclopædia, Art. *Blister* or *Horse Surgery*, at the conclusion of this Work.

Every one should powder his own Cantharides, and as little at a time as he may want, taking care to keep them very dry.

OINTMENT for DRESSING FIRED and BLISTERED LEGS.

I generally let the firing have its effects dry for three or four days before I apply any thing, and then any mild oil or fat will do for a dressing to soften the parts. Butter, lard, sweet oil, or horse oil (a small portion of tar being added), makes a good dressing for these purposes.

Oleum LaurinumOil of Bay.

The green inspissated juice of the Bay Leaf or *Laurustinus*, appears of an aromatic agreeable odour, and for dressing parts where inflammation has proceeded too far, may

have useful qualities, as being more cooling than any similar application of an oily or greasy nature, some of the moisture of the leaf being retained in the extract.

UNGUENTUM AD SCALPURIGINEM. *Mange Ointment.*

*Red Nitrous Oxyd of Mercury, finely levigated, ...*half an ounce.

Hogs' Lardtwo pounds.

Mix them well together, and let it be used diligently for some weeks, till the disease entirely disappears, and for a little time after, by way of security, as the least vestige of a scale remaining will reproduce it.

The Oil of Tar, or Pyroligneous Acid (obtained by distilling wood),

Is another most useful application for cleansing the skin from scales and incrustations of the cuticle, alone, or mixed with lard. It clears and softens the skin in a very agreeable way, and will, if industriously applied, cure the mange also.

UNGUENTUM AD UNGULAS. *Hoof Ointment.*

Take Tallowfour pounds.

Bees' Waxfour ounces.

Tarhalf a pound.

Melt slowly over a fire, and stir them well together in the moment of their becoming solid.

To dry hard heels and cracked hoofs it is most useful, or where the cuticle has been absurdly removed by the rasps of the smiths, keeping the hoof supple, elastic, and free from dryness and hardness. Also to fill holes and fissures of any kind, when it is to be made harder by the addition of a portion of pitch to it.

ON TAR TO HOOFS.

It has often appeared to me that common tar applied to horn for any length of time had very different effects to oil, ointments or grease, penetrating, softening, and half-rotting the horn, mixing and combining as it were with its substance; it is an excellent application however to surfaces irritated by sharp edges and points of horn, on that account; but as a mere covering for common use, I think it objectionable. The genuine *Barbadoes Naphtha* is apparently of more mild qualities in this respect. But common rosin softened to the requisite consistence is every where to be procured, and is unexceptionable.

EXCITANTIA.

LINIMENTUM AMMONIÆ. *Ammoniac Liniment.*

Olive Oil.....four ounces.

Aqua Ammoniæone ounce.

This, well shaken, becomes white and thick, forming an ammoniacal soap. It is used for reducing parts thickened and indurated. Another kind of stimulant embrocation is the *OPODELDOC*, which consists of soap dissolved in a greater or less quantity of spirits of wine, and perfumed strongly with camphor: used in recent strains and bruises attended with swelling.

EMBROCATIO EXCITANS. *Stimulant Embrocation.*

Olive Oilthree ounces.
Camphohalf a dram.
Spirit Turpentinehalf an ounce.
Aqua Ammoniaethree drams.
Water, enough to make it a quart.

Mix well by shaking it, and it makes a useful embrocation.

A CHARGE or STRENGTHENING PLASTER. *Roborans*

A warm or exciting plaster to the skin is called (I hardly know why), a *charge*, by the smiths: it is rather an awkward application to animals covered with hair. Its chief difference from other exciters of the skin is, by its long continued and constant application, and from the warmth which such a covering must impart. The following I believe to be as good a formula as any:—

Burgundy Pitch, or Common Rosinfour pounds.
Turpentinesix ounces.
Olive Oil.....four ounces.

It is used chiefly for strains of the loins and kidneys, and for old strains of the legs that have not yielded to embrocations and blisters. A *plaster of pitch* spread on leather, and lapped round the skank, about six inches in width, can also be used with the same views as a corroborant. A pitch plaster on leather speedily applied is also excellent in recent cases of opened joints in excluding the air, and when well applied and accurately adapted to the part, I have seen it succeed without the use of the cautery.

REFRIGERANTIA.**EMBROCATIO FRIGIFERA.** *Cooling Embrocation.*

Take Vinegar.....four ounces.
Camphor, dissolved in Spirit of Winehalf an ounce.
Water, enough to fill a quart bottle.

Or an ounce of the muriat of Ammonia may be used instead of the Vinegar, or both together.

For sprains and recent bruises, or in cases of scalds and burns. Where these things are not conveniently to be had, cold spring-water, or ice-water, are no bad substitutes.

LOTIO REFRIGERANS. *Cooling Wash.*

Acetic Litharge.....one dram.
Sweet Spirits of Nitreone dram.
Waterone quart.

For slight rubs and bruises, or where patience and the remission of the cause is chiefly required.*

* There are practitioners who will know how to estimate these light prescriptions, for the ignorant are ever apt to prescribe heavily where there is no sort of occasion for it, causing thereby unnecessary suffering to the animals, and loss to themselves.

Cold poultices, and the bruised leaves of fresh herbs, as of *elder*, *cabbage* or *mallows*, come into this division of cooling things, as do also the scraped roots of the *turnip*, *potatoe*, or *carrot*.

RELAXANTS.

Cataplasma.

To any quantity of bran add scalding water enough to wet it, and rub them well together; then put in lard or kitchen grease enough to render it soft, and prevent it from drying and becoming hard and stiff.

Fine Pollard is better than bran. *Linseed Meal* is equally cheap, and is soft, smooth and oily, and perhaps rather preferable. *Fig Dust* makes a good smooth dense poultice. *Potatoes* I have also tried, but do not like them quite so well as the above.

EMOLLIENTIA.

POULTICE.

FOMENTUM TEPIDUM. Warm Fomentations.

Wormwood, Chamomile Flowers, Marshmallows, or Common Mallows, the Herb.

The three together or singly; made by pouring scalding water upon them in a bucket, covered up with a cloth, two handfuls of the herb to a gallon. Highly useful in allaying recent inflammatory actions from strains, and also to parts bruised, swollen, or immoderately hot.

LOTIO RESTRINGENS. Alum Wash.

Alumfour ounces.

Boiling Waterone pint.

For cracks in the skin, and grease chaps; the edges of the sores being anointed previously with lard or hoof ointment.

LOUSE WATER. Lotio contra Pediculos.

Tobaccoquarter of a pound.

Boiling Watertwo pints, infuse 24 hours.

Or Mercurial Wash for the same.

Mercur. Sublimat. Corrosivetwo drams.

Spirits of Winetwo ounces.

Watertwo pints.

Dissolve the Sublimate in the Spirit, and then add the water.

CLYSTERIUM. A Glyster.

Soft Soaptwo ounces.

Waterthree quarters of a pailful.

Smear the inside of a bucket with the soap, pour in the water, or rubbing it in bran dissolve and inject with a syringe, or with *aqua mulsa*, or blanch water. Sometimes it

is necessary after the injection to put a whip of hay or straw against the anus, and to press the tail hard down upon it to prevent its too quick rejection. Common Salt is also used, about a handful to a bucket of water.

I here conclude this small offering to the Veterinary Practitioner, or rather to the British Public, of a new edition of the *Equine Pharmacopœia*, being the third. It contains some valuable additions, and is a more simple, more perspicuous, and comprehensive way of viewing these things, than has hitherto been entertained; and from having in early life much cultivated the sister arts of Botany and Chemistry, have found them now usefully assisting me in giving greater clearness to these arrangements.

ADDENDA.

ALGARROBA BEANS. *Ceratonia Siliqua*.

The fruit of this tree is given to the mules very commonly in Valentia and also in South America.

On account of some useful remarks we are induced to add the following to the Pabular Division.

REIN DEER MOSS or LICHEN. *Lichen rangiferinus*.

As this useful animal is the Horse, Cow, and Sheep combined, for the benefit of the arctic world, and this plant appears to be for these animals an indispensable provision, so we wish more particularly to introduce it here, to notice one particular property belonging to it, and which, if attended to, may make future essays of introducing this delightful animal into the more southern regions to be attended with more success. My friend, William Bullock, Sen. brought over to England more than twenty of these creatures; thirty he had purchased, but lost many by the way, on ship board, in a manner the most singular, for believing, that as they came from a cold climate they could not be kept too cold, he turned the mainsail of the boat to blow down upon them in the hold, the consequence was, for he did not distinguish between mere cold and *drafts of air*, that he lost ten or twelve ere they could be landed; on arriving in London with them he sent for me, and I told him their complaint, inflammation of the lungs, and with difficulty we saved a few of them; others died. In attending, I found another complaint among them; they were miserably gripped with their food, which was principally hay and oats; and on giving them the Gripe Tincture, I saved several more which were on the point of death; others were too far gone to recover; and within a twelvemonth not one was found alive, though afterwards turned out in a park with every convenience.

On reading the travels of Dr. Edward Clarke in these regions I became possessed of a secret particularly worth knowing, to those who may hereafter have any thing to do with these animals. It is stated in a memorandum which I made at the time, as follows. Dr. Clarke says, Travels Vol. x. p. 139. Speaking of this lichen, "The rein deer take it from beneath the snow, where it affords a most delicious diet, being both meat and drink to them. Towards this month (September) we first observed the change that was taking place in this species of lichen. We then found it soft, tender, damp, and capable of being compressed like other plants for our herbary, between the leaves of the books we carried with us for this purpose.

"In this state its appearance was so tempting, that when fresh gathered, we ventured to taste it ourselves; its luxuriant and flowery ramifications somewhat resemble the leaves of Endive, and are as white as snow. To our surprise, we found that we might eat of it with as much ease as of the heart of a fine lettuce. It tasted like wheat-bran, but after swallowing it, there remained in the throat and upon the palate a *gentle burning heat, as if a small quantity of pepper* had been mixed with the lichen; cooling and juicy as it was to the palate, it nevertheless warmed the stomach, and could not fail of proving a gratifying article of food to man or beast during the dry winters of the frigid zone."

Now it is this peppery quality of the lichen that it appears necessary should be known, understood and attended to, as its kindly digestion will much depend upon it, and where in this more southern latitude it is found deficient, it should be looked to and artificially supplied, as it appears to me in order to the full success of the experiment.

In using this Portable Equine Surgery and Pharmacy, I have experienced the greatest convenience and satisfaction, as also security from abuse and pillage. How often for want of the ready aid is the thing that ought to be done procrastinated, or entirely neglected, or idle and improper substitutes used; therefore let none think too lightly of, or despise, these simple measures. The expense is insignificant, and they may occupy almost any apartment without disfiguring it. Two chains extend over the two boxes, as seen in the Frontispiece, and which are fastened with a Padlock.

Other articles that are very easily obtained at all times, may be purchased as they are wanted, and in the quantity wanted, so as to leave no residue to encumber the box.

Case with a Tin Box divided, for Ointments, &c. a Depot for Knives, Spatula, and Instruments during Operations.

Leather Pouch of Drawing Knives, Scalpels, Curved Needles, and Seton Needles, Dissecting Knives, Fleams, Lancets, Wood Rasp, Clans for Castrating, Scizzars, Rowels, Iron & Wood Splints, Sponge, Tow, Flannel, Calico, Ties of Tar Rope, Dissecting Gown.

CLARK'S New Hobbles, for casting Horses, Blinding Hood and spare Rope. Firing Irons, Olive pointed Searing Iron, Docking Iron, and Glyster Syringe.

Scale, 1-10 to an inch.

Conical Box containing Three Treatises of the Description alluded to

The Hoof of the Horse properly prepared.

Various kinds of SHOES, and APPARATUS for SHOEING HORSES.

SLAB FOR OINTMENTS, &c.	
Drawer divided transversely: HERBS. SALT in a Jar. SOFT SOAP.	ALOES PORT. A LADLE. PIPKEN. MOULDS for making BALLS. WOOD BOWL.
BARLEYMEAL. OATMEAL. P. UTILIS.	GALLIPOTS. VIALS. DRENGING HORN. CRUCIBLE.

PLAN OF THE INTERIOR ARRANGEMENT AND CONTENTS.

5									
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1	2	3	4	5					
h	i	k	6	7	8	9			
10	a	b	c	d	e	f	g		

1	2	3	4	5	6	7	8		
9	10	11	12	13	14	15	16		

1	2	3	4			
5	6	7	8			

1	2	3	4			
5	6	7	8	9	10	
				11	12	

No. 5. Plain box with a lid, holding Scales, Weights, a graduated Measure, a Spatula, Papers, &c.

No. 4. Case going within the top of the case below, and filled with square Bottles, chiefly for Liquids.
1. *Gripe Tincture.* 2. *Spir. Vin.* 3. *Vinger.*
4. *Spir. Nitri. dulc.* 5. *Spir. Turpenti.* 6. *Gummi Oil.*
7. *Sulph. Acid.* 8. *Papaver. Acid.* 9. *Sol. Ammon.*
10. *Cantarella.* 11. *Tr. Opii.* 12. *Mer. Nitri.*
13. *Sol. Sal.* 14. *Ferri Sulph.* 15. *Cornus. Sudd.*
16. *Linat. Ferri.* 17. *Acetate pulv.* or *Calcobar.*

No. 3. A Deal Tray with slips of Wood to retain the Specie Bottles in their places lying down. This Tray falls into the Case below, and is drawn out by the Handle.

1. *Antimony* 2. *Antim. Tort.* 3. *Bolus Arvenca*
4. *Camphora* 5. *P. Curcumae* 6. *P. Canthar.*
7. *Platana* 8. *P. Nitri* 9. *Calomel*
10. *Pimento* 11. *Creta Ppt.* 12. *Mer. Nitri.*
13. *Zinci Sul.* 14. *Ferri Sulph.* 15. *Cornus. Sudd.*
16. *Linat. Ferri.* 17. *Acetate pulv.* or *Calcobar.*

No. 2. A square Tin Box with four Partitions. Three round Stone Jars, and a Copper Pot with a Handle for Digestive Ointment.

1. *Digestive Ointment* 2. *Turpentine*
3. *Tar* 4. *Resin Ointment*
5. *Resin Ointment* 6. *Turpentine*
7. *Lard* 8. *Resin Ointment*

No. 1. The bottom of this Case is formed into a Magazine by Deal Partitions four inches deep, a Lid covers it, except the Nitro, which is exposed by a piece cut out; on this Lid stand the Bins of No. 2; a Brass Handle raises this Lid.

1. *Nitre* 2. *Ferri Sulph.* 3. *Cera*
4. *Pimento* 5. *Alaea* 6. *Zinci Sulph.*
7. *Sapo* 8. *Resin com.* 9. *Ammon.*
10. *Antimon.* 11. *Creta pp.* 12. *P. Glycyrrh.*

INDEX PHARMACEUTICUS.

Egyptiac, how made	36	Cough Balls, how made	33	Flesh, on, for Horses	12
Antimony, Tartarized	32	— Drench, ditto	33	Fish, on, ditto	12
Acidulous Drenches	32	Condition Powders	35		
Aromatic Medicines	35	Conglutinum, how made	37		
Antimony	35	Cantharides, on		G.	
— Sulphuret of, 16; liver of .	17	— Tonic Drink	31	Gripe Tincture	28
Ammoniac Liniment	39	— Ball	31	— Drench	28
Aqua Ammonia	40	— Nasal Gleet Powder	35	Gruel Oatmeal	19
Alum Wash	41	Cinchona, or Bark, on	31	— Milk ditto	28
Aqua Mulsæ, or Blanch Water .	41	Cureuma, or Turmeric	35	Grass, its constituents	9
— how made	33	Common Salt	35	Grain for Horses	11
Agglutinantia	37	Chalk, on	32, 37	Gourds ditto	12
Alkanet root	25	Copper, on, 26; Sulphat	26	Ginger	12
Augment for balls	24	Calomel, on	16, 34	Gamboge, on	15
Aloes, how made, balls of	28	Camphor	40	Glauber's Salts	16, 25
— Drench	22	Corrosive Sublimate	41	Gentian	35
— Gum of	22	Charge, or Roborant, how made .	40	Genoa Oil	36
Anthelmintics, or Worm Med. .	34	Cataplasma, or Poltice	41	Gleet Powders	35
Ætheops, mineral	17	Clyster, to make	41		
Alteratives, on	17	Conium, or Hemlock, on	13	H.	
	♦	Condimenta	12	Hay, its constituents	9
		Cicuta Virosa	14	Horn, drenching, how made . .	25
MAT. MED. DIETETIC COND.		Colocynth	15	Honey, a cohesive for balls . .	33
ETC.		Castor Oil	15	Horse Oil	38
A.		Carrot, Daucus	12	Hordeum	11
Aloes, nature of	20	Cane tops	10	Hyssop	33
— adulteration of	21	Cassim	10	Hedysarum	9
— Barry's Vac. apparat.	22	Cynosurus	9	Hemlock	18
Ægyptiac, Mem. on	26	Clover	9	— Water	14
Arcaris, on	34	Cytisus, Roman, on	9	Hydropiper	9
Algaroba Beans	42			Hellebore, white	17
Alcohol	18	D.			
Animal Food	12	Diuretics	23	I.	
Acacia-tree	10	Dermatæicæ, or Skin Med. . . .	38	Iron, on	26
Anthoxanthum	9	Dressings for blisters	38	— Sulphas	32
Alopecurus	9	Desiccative Powder	37	India Pink	34
Agrostis	9	Dogs' dung, white	23	Isatis, or Woad	10
		Diseases of the Horse, Gen. View of	7	Ipecacuanha	16
B.		— local	8		
Bitter Drench, how made	30	Drugs, bad, exposed	5	J.	
— with Spices	30	Dietetics of the Horse	9	Jalap, on	15
Buckthorn Syrup	26	Dropwort	13	Juniper, Oil of	25
Blisters, mild	38	Digitalis	12		
— strong	38	Dactylis	9	K.	
— relaxing, or warm	38	Diarrhœa Drink	32	Kali causticum	33
Blue vitriol	17, 36	E.		Kermes, or Yellow Merc. . . .	16
Burgundy Pitch	40	Exciting Embrocation	39, 40	L.	
Brimstone	27, 35	Emollient ditto	33, 41	Linimentum Ammoniac	39
Bleeding, on	33	External applications	36	Louse Water	41
Bran Tea, or Blanch Water . . .	18, 33	Epsom Salts	32	Lungs, inflamed, on	7
— Mash to make	18	Essential Oils	23	Linseed Oil	23, 33, 36
		Euphorbium	38	Laurinum, or Bay Oil	38
Bran, on	11	Elatarium	15	Lard	38, 39
Beans, on	11	Emetics, on	16	Lichen rangiferinus	42
— Flour	35	F.		Lolium, or Darnel	9
Barley, on	11	Fever Drench	32	Lac, or Milk	12
— meal	27, 35	Flux ditto	32	Lucerne	9
Blank, on	11	Frigorific Embrocation	40	M.	
		— Lotion	40	Mash, to make	28
C.		Fomentation, tepid	41	Maladies, General View of . .	7
Cordial Medicines, on	26	Friar's Balsam	37	Mange Ointment	39
— Ball	27			Myrrh, Tincture of	39
— Drench	27	Fruits, on, for Horses	12	Medico-dietetics	18
misapplied	6				
Cohesive for making balls . . .	20				

SUPPLEMENTARY MATTER

TO THE

PHARMACOPŒIA EQUINA.

Preface, p. 7, l. 27, after *success*, add, *Ophthalmes* are also frequent, and to be reduced by vigorous depletion, abstinence from heating food, purgatives, vesicatories, and fomentations. *Gripes*, or indigestions, are also often supervening. For its treatment, see *Nosology*, in an express article.

Page 8, line 4, after *apprehended*, insert, without rest, or almost without any; a continual labour and enormous loads are poorly compensated for by an overdose of heating food; distress follows with disordered stomach, next the liver becomes diseased, then comes, more or less suddenly, the Farey, and then the just reckoning, loss of labour and of horses, and so barbarity and folly is made to receive its just recompense.

“As nature, kindly in her wide domain,
Scatters some antidote to every bane.”

Page 9, line 15, insert, it is easy thus to analyze into its component parts any portion of hay presented, which will give us a shrewd guess or insight into the place of its growth, whether upland, meadow, hill, or swamp. The condition of it is next to be considered, and the circumstances attending the getting it in, and its probable salubrity, or otherwise, for the horse.

Page 9, line 16, after *clover*, insert, the hay seeds are an annoyance to the horse, lying in the bottom of the manger, and if neglected, liable to get mixed with his corn, and should be carefully removed. A convenient way of doing it is, by a small trap door at one end, through which also the accumulating chaff and dirt should be conveyed in the well-regulated stable.

Page 9, line 34, after *purpose*, insert, sheep walks also have been found beneficial, perhaps from the *thymus serpyllum*, or *motherthyme*, growing there, a warm exciting aromatic. The note on *lichen rangiferinus*, at the end of this work, may be also inserted here in a future edition.

- Page 10, line 1, insert, in a very intelligent article in a newspaper, (see *Morning Chronicle*, of September 20th, 1842), is the following paragraph respecting farm horses of the Mid Lothian agriculturists. "The winter keep of the horses is a mixture of half chopped straw, and half steamed turnips or potatoes, and this feed is not only found much cheaper than hay and oats, but the horses are kept in better condition by it, and enjoy better health than with the higher food. The farms here are all held on nineteen years' leases, the beneficial source of all improvement."
- Page 11, line 14, after *fagopyrum*, insert, also called *sarrazin*, in the south of France, and it is said, when in flower, to intoxicate sheep if fed on it. See *Mortimart Boisse*, tom i, p. 61.
- Page 11, line 37, after *auquiot*, insert, *peas*, *pisum*, formerly much given to horses in this country and also in Sweden.
- Page 11, line 38, after *detrimental to horses*, insert, in large quantities no doubt, but a scattered few, by their stimulating effects, would aid digestion, probably, and not be injurious.
- Page 12, line 2, after *boil them*, insert, others only parboil them.
- Page 12, line 4, insert, *Liquorice root*, *Glycyrrhiza*, chiefly used as an augment in making cough balls.
- Page 12, line 30, after *food*, insert, and assimilating it. A lump of *rock salt*, in slow digestions, is most useful lodged in the manger. A bad case of gorged stomach I cured by this means, April 1845, that had existed more than a week.
- Dog's Food. P. 12, l. 30, after *liquor*, insert, the continually increasing price of dog's meat induced me to use the chandler's graves, chopping it fine with an axe, pouring scalding water upon it and steeping it one hour; to this, further diluted, I add six times as much barley meal, a pinch of salt, and a trifle of pepper; let them be well mingled in a proper vessel with a case knife, or in a wooden bowl by a heavy pestle. Cats also like it, but care should be taken not to surfeit them with it. Every fourth or fifth day meat may be interposed. In this way the rapacity of the dog's meat people may be checked. For on account of the price both dogs and cats are often insufficiently fed.
- Page 13, line 33, after *Prof. Vibourg*, insert, see also Watson's account of the effects of the yew-tree, in the *Philos. Transactions*, vol. xlvii, p. 199. On *Enterocalli*, by ditto, vol. xlviii, p. 800, and vol. xliii, p. 268.
- Page 14, line 4, after *misfortune*, insert, see also *English Botany*, No. 2313, in proof of its fatal effects. The gripes, however, is often, in these lonely situations and unaided cases, mistaken for poison, indeed poisonous is almost any herb that is not duly digested; that poison and the gripes become almost synonymous terms.

- P. 15, after *price*, foot of page, insert, RHUBARB, *Rheum palmatum*, the root. I find the following notice in my memorandum book. I gave at the Veterinary College, March 8th, 1792, an ounce of powdered rhubarb made into a ball, to a pony, about twelve hands high; two hours after he seemed in pain, and was pawing his litter with his fore feet, this he shortly after desisted from, nor was he afterwards in any way affected. His dung appeared in smaller balls, and I thought was rather harder than before. On November 7th, 1803, I gave one ounce and a half of best rhubarb to a bay hack horse, without its producing the least purgative effect though he was carefully watched.
- Page 16, line 4, after *effect*, insert, and I am well satisfied I have seen mischief done by its administration by inexperienced hands, producing much distress without any benefit whatever.
- Page 16, following the word *Horse*, last line, insert, ELATERIUM, the extract of the *cucumis sylvestris*, or wild cucumber. One scruple was given by me to a grey horse, April 26th, 1794. It took his appetite away for a few hours; no other effect was perceived.
- Page 17, line 31, after *believe*, insert, however, for a formula of this description, see page 35, the *Tonic Bitter Powders*.
- Page 18, line 24, after *effects*, insert, a great deal of revolting cruelty was practised at the Veterinary College, on Coleman coming to it in 1794, in throwing poisons into the veins of asses and horses; I find the following recorded in my book of notes, which may prevent the repetition of such useless cruelties, March 7th, 1794; an ass was tied down and the integuments over the jugular vein divided, and by a crooked needle the exposed vein was ligatured in two places, and divided transversely between them, into the lower portion, communicating with the heart, a brass pipe was inserted and tied, and then the ligature on this portion of the vein was removed, having been only a knot and bow easily loosened. An infusion of one dram of tobacco in ten ounces of water was taken up by a syringe and thrown into the vein. The effects were almost instantaneous, and of the most violent nature, every muscle throughout the whole body was thrown into convulsions and violent contractions, the eye was turned round in its orbit from forwards to backwards. The *membrana nictitans* shot out from the eye in a most horrid manner, the nostrils were dilated to their utmost and thrust forwards, a snorting and rattling in the trachea. The legs pushed out, in short he appeared for a little time perfectly dead; but at length the eye returned to its usual situation and the muscles relaxed, but still the greatest agony appeared; the heart beat so fast we could not count it.

After about ten minutes I counted the pulse by feeling the left side

of the thorax, and it was 168 strokes in a minute. The animal lay panting in this way for one hour, then was able to get up and stand. About five hours after the operation I found the pulse 140. The next morning, nineteen hours after the operation, the pulse was 120; in twenty-four hours, the pulse the same, but more languid, and I thought his saliva smelled of tobacco. His mouth, however, seemed locked, that I could not open it. About thirty-four hours after the operation he grew more and more languid and died.

Page 18, line 24, after *effects*, insert, INSECTS. *Cantharides*, a very remarkable effect of the cantharides when given in too large doses is, that it changes the colour of all the mucous membranes to a deep crimson, as though violently injected and inflamed; this effect I have observed in several cases where the powders, through inadvertence or ignorance, were administered without the diluting augment in sufficient quantity; as by the oat, or the barley meal, or liquorice powder, conceiving them superfluous additions.

Page 19, line 26, for one-fifth read two-fifths.

Page 20, note, line 6, after *boiling down*, insert, accurately figured in the *Flora Græca*, see also Maycock's work on the plants of Barbadoes.

Page 20, line 37, after *flexible*, insert note.

About the year 1804, I first found out and used treacle for forming a ball with the aloes, and found it most excellent in consistence as in its effects also; and about some twenty years after, one Morton, of this blessed College, quitting his counter in the Borough, got dubbed a Professor there; so low, by misuse, is this term got, and he, taking this simple and elegant compound, added to it, what would any chemist imagine, common linseed or other oil, and so corrupted it as to prevent any acknowledgment as to its inventor, and then called it, or at least left them, the pupils, to apprehend it as his own discovery. Assuredly, oils and fat are most nauseating to the horse, and no purgative at all; and in its mixing with the aloes, most incongruous and difficult, betraying an ignorance of chemistry as well as of proper medicinal prescription.

Another of these worthy collegians told me, as I walked with him to the slaughter house to examine a dead horse, that he much liked the aloetic purgative ball, as recommended by me, only they were subject to a deliquescence. I replied, that for thirty years I had constantly used them, and never had seen a single instance of their deliquescing; and I further desired to know if he had adhered strictly to the formula. "Oh, yes, he had; but the chemist who made them up thought a little alkali would be an improvement"! Whether the aforesaid chemist

was a full blown Bloomsbury or not I did not hear; but it is very certain that this great school gives a preference, of all others, to the above Mr. Morton.

Page 22, line 21, after *resinous matter*, note. This, by way of seeing its effects, I administered to a horse alone, but it had no operation as a purgative. The gum operated well in a dose of five drams given to a young horse, November 4th, 1841.

Page 22, line 34, after *proceeding*, insert, it has also appeared to me an undoubted fact, that much of its virtue is lost by frequent boiling, and the less that is done with it after receiving it from the manufacturer, the better. I found three parts of the extract, and two of treacle, to afford an excellent consistence, cast in paper tubes and melted together. As to the original prescription, any one who fairly tries it will find its consistence and its operation with nothing to wish for. But whilst some are employed purging and clearing the path of knowledge, others seem as actively employed in throwing back the feculencies again into the stream.

Page 23, bottom of page, after *Charybdis*, insert, another case (John Hand's) has since occurred, where three pints of this abominable oil had been given by the farrier. I tried to get it digested, by giving upon it four eggs rendered nearly solid by beating them up with oatmeal, but to no purpose, the mare died.

Page 25, line 22, after *wine*, insert, or simply by a few grains of turmeric, rubbed down in a mortar with a little of the mixture.

Page 28, line 8, after *spices*, add, or THE GRIPE TINCTURE.

Page 28, line 26, after *certain*, insert, we have also, in an express dissertation, shown this disease to be the same as the human *cholera*.

Page 31, line 2, instead of fifteen grains read eight grains, instead of cantharides seven grains, read five grains, add also to the above prescription thirty grains of meal.

Page 31, line 7, insert, linseed meal, so commonly resorted to, is of too oleaginous and indissoluble a quality for the purposes of a drench, in a ball not so objectionable, or as a powder. For prescriptions for powders, however, see page 35.*

* I have been apprehensive lately, that the dose here recommended was rather too strong, and therefore desire to substitute eight grains of *zinc sulphas*, and five grains of *cantharides*; at least to commence with, if used daily, as the medicine should not occasion distress of any kind, as that would defeat its intention; if small doses do good as tonics, large ones may do much harm.

Page 32, line 34, after *salts*, insert, for these cases of diarrhœa, in reality, proceed, generally, from the want of the biliary and other intestinal secretions,

inducing inflammation and a flow of arterial capillary serum into them, the source of the purgative actions, and will be relieved by the following drench, which I can recommend as very valuable on such occasions.

Page 32, line 42, after *added*, insert, to these measures, bland, demulcent injections may be used, made of dissolved *starch*, *flower*, *gum Arabic*, or *pearl barley*, these clysters, not in large quantities, that they may be the longer retained, defending the mucous lining of the bowels from the acrimony of their own morbid secretions, and thus assist in inducing a return to their proper natural actions and tone.

Page 33, line 25, after *dose*, add, also a lump of *rock salt*, placed in the manger, will stimulate to quicker digestion and so do good.

Page 34, line 10, after *ascarides*, add, bitters, we find, were employed by the ancients to kill the worms, and *aloes* among the rest; by which, it is probable, its invaluable property as a purgative was first discovered. As powders are by far the most convenient form for administration, beyond balls, or drinks, or drenches more properly, so we give farther examples of them.

Page 35, line 14, insert, for two drams, half an ounce.

Page 35, line 16, insert, for eight ounces, four ounces.

Page 35, line 17, insert, let a heaped tea-spoonful be given, &c.

Page 35, line 18, insert, to reduce to some stated rule the proportion of the augment to the medicine employed, I weighed out an ounce of oatmeal and found it to give seven teaspoonfuls, the teaspoon not very much heaped. Therefore, to every twenty-eight grains of the cantharides finely powdered, may be added one ounce of oat or barley meal, and together, with the spices and zinc, a fully heaped teaspoonful would be a proper dose, containing four grains of cantharides and four of zinc in each.

Therefore, four ounces of oatmeal in this proportion should receive $28 \times 4 = 112$ grains of cantharides, or one dram, two scruples, and twelve grains, or a short quarter of an ounce, having four grains of cantharides and four of zinc in each dose.

In exhibiting these powders the augment must be strictly attended to, as we have known, more than once, gentlemen using the medicines alone, supposing the augment of no consequence; and so were giving more than four times the dose recommended, with very distressing consequences. This powder may be kept in a pot or gallipot for convenient use in the stable recess.

If given in too large doses it distresses and does harm, and where this has been the case, we have observed, in a very remarkable manner, that it affects all the mucous membranes exposed to view, as the mouth, nostrils and eyes, etc., turning them to a deep injected crimson dye, as

though highly inflamed with a dewy moisture thrown out upon the surface. Perhaps, in this way, we account for its operation on the bladder, causing strangury, where it is most inconveniently felt, the lining of the bladder being a mucous membrane, occasioning a dreadful scalding in the making of urine, and often a suppression.

If there are any ulcers in the nose in sight, and that can be got at, let them be touched with a solution of sulphat of zinc, of moderate strength, by means of a linen rag tied to the end of a stick.

Page 35. After *Tonic Bitter Powders*, insert, or *ALTERATIVE BALL*.

Page 35, line 34, after *rich*, insert, *orange* colour.

Page 36, line 20, after *afford it*, add, most useful as a drying ointment, and also in excluding the air in opened joint cases, as is also the above resinous digestive, when made extremely viscid and tenacious. For this purpose a dense pledget of tow, and with the hand a sufficiently thick mass is scooped out for application.

Page 37, line 34, after *traumatica*, insert, or *wound tincture*.

Page 39, line 18, after *cuticle*, insert, or natural rind of the hoof.

Page 41, line 16, after *hot*, insert, in some cases to be applied cold, as where there is inordinate heat.

Page 42, line 16, instead of *lichen rangiferinus*, read *Icelandicus*.

B. C.'s Works on the Foot of the Horse are out of print, except the following: on Running Frush, and Ringbone; price 3s. 6d. On Canker and Corns, price 3s. 6d. Model of the Hoof of the Horse, explanatory of the plan of its structure, with box, lock and key, and a description, price 12s. Also, large section of the Horse, coloured, with a description, 2l. 2s. Description and plates of explanation, alone, 10s. 6d. History of the Bots of Horses, and their mode of propagation and species, &c. 15s. coloured; 10s. 6d. uncoloured. Advice to Farriers on cutting the Frog, 6d. Section of the Head of the Horse, as large as life, coloured, 1s. 4d. with a description and remarks.

Fig. I

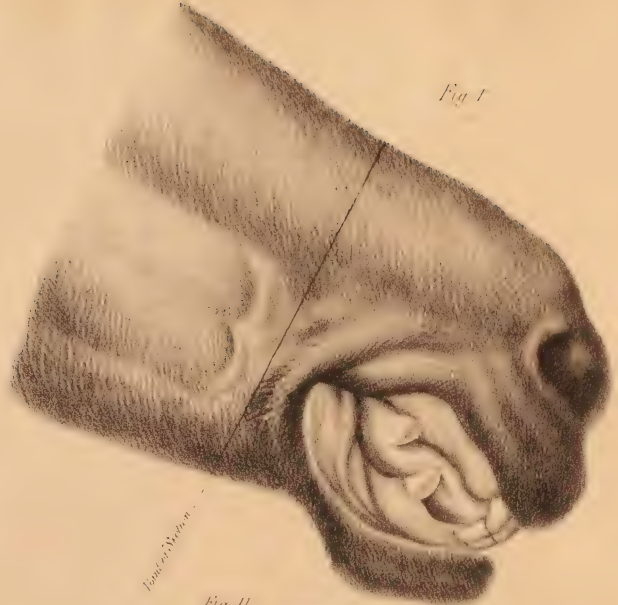
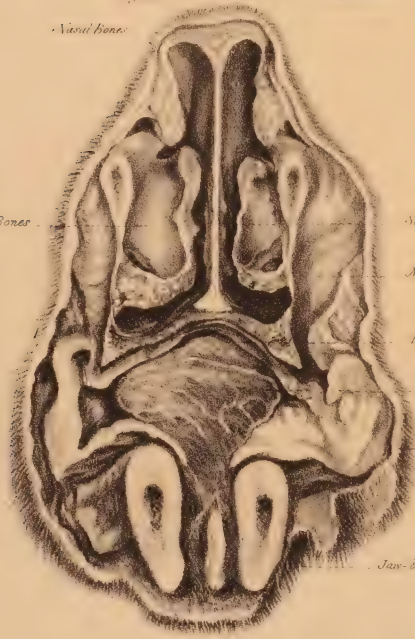


Fig. II

Vomer bone.

Turbinate Bones.



Septum nasum.

Maxilla superior.

Palate.

Tongue.

Cartilaginous Nose.

Jaw-bone.

A View of the form, relative magnitude, & situation of the jaw-bone, Tongue, & Nostrils, &c.

A TREATISE ON THE BITS OF HORSES. (CHALINOLOGIA.)

By BRACY CLARK, F.L.S., and Member of the Royal Institute of France.

SECOND EDITION, LONDON, 1835.

ONE of the greatest evils and abuses of the horse that still seems to lie before me to treat of, is the biting; and which, considering how simple an object it is, surprises me has not been done long since: but somehow the subject of horse affairs, through the tyranny of those who are occupied with it, seems as it were beset round with some spell or enchantment, so great is the fear of the general public in intermeddling, as they would call it, in these matters; so that abuses are perpetuated before our eyes, and seen every hour of the day, yet none care to interfere. And neither is it with any mean feigning that I say I feel my hands truly feeble for the task, and the arrival of those years that do not improve a writer; yet is the task wanting, and in hoping yet fearing I engage myself in it, heartily wishing it in better hands, which it well deserves.

It is the property of ignorance to grasp at power by whatever means it can be obtained, and no sooner are they in possession of it, than they abuse it and use it tyrannically; whilst lookers on, supposing all is right, and that experience must have taught them the best methods, surrender their understandings to these miserable agents, scarcely reflecting on the atrocity of their measures: although but a very little well-directed examination and real attention to the subject would dissipate the illusion, and expose in its true colours the monstrous folly of their proceedings. A very large portion of these cruel and unmerited sufferings will be found, on examination, to proceed from the cherishing and encouraging unfounded fears and apprehensions which ought with propriety to have no existence. Fashion also has had her share in it, and not unfrequently it is the interested purposes of the makers and venders of bits, and of those who derive a profit in recommending them, and are sharing in the plunder of their masters: others again love a mystery, and think by such uncouth and complicated machinery to guard this department of knowledge from being intelligible, and so maintain their empire and secure their interests. For the true biting of the horse does not require complication or harshness, or severity, but, on the contrary, every purpose is best served and obtained by the direct contrary. Since harshness is much more likely to produce the disobedience and danger that it pretends to prevent, than to

render it less accessible; making them to commit often from pain and rage, the very faults complained of, and then desire to remove by a further severity.

It may be right here just to state, preparatory to entering on the matter, that the present essay is a more extended account of the nature of bits and biting taken from an article published by us about thirty years ago in Rees's Cyclopaedia, and which has served us usefully as a substratum on which to erect the present more enlarged edifice; this premised, without further preamble, we proceed to our task in first considering—

The origin of the term Bits. It is usual with us in England to designate whatever irons are attached to the bridle and placed in the horse's mouth for the purposes of guidance or restraint by the term *Bits*; which designation would easily convey a notion to many minds that they were so called from being bits, that is, pieces of metal purposely designed and properly suited to such offices; however natural such a conclusion might appear, such is not the case, as we shall see presently, and it is perhaps unfortunate for the animals that their real purpose was not alluded to in their name and appellation, as such might have exposed often their irrelevancy to such an office, and saved them from much suffering.

It will be pretty evident that the term *bit* is derived from the active verb *to bite*, which is rendered tolerably conclusive we believe from our finding in other languages the same term, and from the same verb: as in the Latin we have the term *morsus* from *mordere*, to bite; and in the French we have a similar term in *les mords*, evidently derived from their verb *mordre*, to bite; and conveying the same intention.

In the German again, which may be considered a dialect, together with the English, from the old Saxon, we have the word *gebiss*, also from the active verb *biesen*, to bite; strongly confirming the above remarks.

Dr. Johnson, in his Dictionary, informs us, that anciently in this country they went by the name of the *bitol*, and what exactly this additional *ol* meant was not at once evident. But on consulting Johnson's usual authorities in these Saxon matters, as Skinner's excellent *Etymologicon Linguae Anglicanae*, we discover that anciently in England a bit was called a *bitole*; and in Bailey, we find also the same expression, so that the *ol*, in Johnson, is clearly an error of the press, or an inadvertence, for *bitole*; now how we should explain this ancient term is not at once obvious; we conjecture, however, after some reflection, and are led to believe, that it will admit of a probable solution by the consideration of the application of *-le* in some other instances in our language, and by which very slight appendage or addition a verb is conveniently transformed into a noun substantive, as for example from the verb *to spit*, we obtain *spittle*; and from the verb *to gird*, we obtain *girdle*. And from the French word *bout*, we obtain the big, or *but-end* of a thing; and by the addition of *le*, we obtain *boutle* or *bottle*; and in the French language, to make it in the feminine gender, we put the double *ll*, as *la bouteille*, and this is done by the euphonious dictation of the ear only, and not from any consideration of the nature of the thing itself, and is therefore matter of taste only, which is but an uncertain rule. It is therefore probable that to our Norman ancestors it is, rather than to our Saxon, that we are indebted for this by no means unuseful term.

We think, indeed there is every reason to believe, that in the very first use of these imple-

ments, they were called the *bites*, the *i* being pronounced long as in the verb to bite, but this in time being found inconvenient, as clashing with the term for an infliction of the teeth, it became changed into *bitle*, which was partially used and perhaps only lasted for a time, and then by that natural course which every language takes in its use, of shortening words, it became changed into *bittle*, and then into our modern appellation of *bits*; for it is from the participle past of the verb that we obtain this word, as being the thing *bit*, or *bitten* upon, or that is champed upon between the teeth, or more properly, the bars of the mouth.

A philological friend of mine contends, that as the participle past is, bitten, with two t's, so ought the word bit to be spelt with two t's, instead of a single one; we, however, reply that the proper participle past is *bit*, with a single *t*, and that the word bitten, though now as commonly used as the other, was at first perhaps a conventional, or convenient term only to relieve in many cases, which it handsomely does, the sharp abruptness of the other; therefore, we see all the best and most classic writers adopt the single *t* in the spelling. And we think also that the ancient term *bittle*, as being more distinctive, is far preferable to the modern more ambiguous term, *bits*.

In placing these irons in the mouth of the horse, and communicating them to the hand by the reins, we establish, or ought at least to establish, a sort of language of communication with the animal, and which, when adroitly and suitably applied, and used well, would bear no mean analogy to such, but unfortunately however for the worthy animal, this language of the bits at present, is possessing but too often, not the douceur or softness of the Italian, but is, in reality, a very crack-jaw and worse language than any of the harshest dialects of Sclavonia; which, had their name borne some correspondence to their real uses and intentions, could not hardly have been so eminently the case, for it is inconceivable to what extent the grossness and violence of this machinery is carried, and exists at this day.

For we see irons of the most preposterous figures and fashions thrust into their tender mouths under the name of bits, and where any just definition of a bit is wanting, anything becomes a bit which they please to call so; complexity is often preferred to simplicity, where simplicity would better answer the purpose, and, unfortunately, too many interests are involved in pursuing such a course, for well is it known to every intelligent and experienced horseman, that gentle measures, and perseverance in them, will avail more and produce better effects than harsh or severe ones.

How often, indeed, are their sufferings, and the eloquent expression of those sufferings by various movements of the head, disregarded, till obedience and patient suffering can no longer endure such torture, and disobedience and mischief becomes the fruit of their use; often, indeed, the pitiful boon is denied them of expressing their sufferings, by being strapped up and strapped down, and strapped sideways, and strapped in all directions, that they shall not even relieve themselves, or swerve from what is most distressing and annoying to them, till at last, maddened beyond all bearing and endurance they break through every restraint, and occasion those very disasters of which they are accused, and as not being under sufficient control; and further and still more abominable torture is then proposed for them. And all this to an animal that is well known to be, if duly used and judiciously brought to his task, generally speaking, the most docile and willing of all slaves, to serve us by night and by day; and is ever ready at the command

of his master to rush even into the midst of peril and danger, and to forfeit his life for him, if such be his will and pleasure.

Whilst some horses carry their heads low, with their noses almost to their breasts, trying thus to avoid the crushing operation of the lever-bits upon their bars, others, on the contrary, are carrying their heads aloft in the air, with their eyes and eyeballs staring and straining as with affright and pain, and as though appealing to heaven against such unmerited cruelty and oppression; and although thus expressing their bitter anguish, are they unattended to, or, perhaps, only by the cant remark that they *must get used to it*, as if such were possible. And use and custom has but too much reconciled us to these objects to see and feel them in their true enormity, or our feelings would certainly not be so seared against them, but animate us to some exertion in their favour. And often, if there be any swerving from the agony, or a disposition to express their uneasiness in any way, the thong severely applied is the unanswerable argument resorted to overcome it, adding to suffering the most cruel of inflictions. Can we wonder, then, that sometimes, infuriated beyond all bearing at such merciless proceedings, they should lose all restraint and patience, and do mischief. We wish not unnecessarily to over-colour the picture, for that indeed it would be difficult to do, but to rouse if possible public attention to these glaring cruelties and follies, and, without displaying some of its horrors, we should be doing but a languid and very imperfect justice to the real state of the case.

The more or less sharpness of the horse's jaw-bone or bars of the mouth, or of occasional inequality in the height of these, for which see *Frontispiece*, the different thickness or thinness and degrees of sensation in the membranes covering these parts, will occasion a difference of suffering in the various individuals receiving them, yet frequently it is with the most obtuse as with the most acutely sensitive subjects that the same bits are used; for in a general way, the care of biting the horse, and of applying these instruments, is left entirely to those who know but little of the distinction between the one kind of mouth and the other.

Now whatever may be said of individual instances of rebellious horses to justify this, there can be no doubt that by far the larger share of them, as we have before stated, are most gentle, and therefore is this suffering a gratuitous and unnecessary infliction, and cannot fairly be brought in excuse or extenuation of such conduct. Neither can it be said that the animal is too sensitive of pain, for we have often seen severe pain inflicted on him where operations have been necessary, and his bearing it with wonderful fortitude; we have also frequently seen nails driven so near the flesh in his feet as to fester, and produce pus or matter, without its being known to his driver that anything had affected him; so that they are courageous in bearing pain, and do not flinch at a little, is most certain.

The sporting man formerly, and the hunting man and the traveller also, used to deride as preposterous and unjockey-like these unwieldy long machines, or lever-bits, both as unfair and betokening ignorance, cowardice, or maladresse, in the person using them, and to ride "*hard and sharp*," as it was called, was left alone to the butchers and their blue-frocked apprentices; but now the custom has become almost general, and even from examples in the fashionable world, encouraged by some of our courtly foreigners of distinction who have honoured us with their visits, by whom has this practice been greatly encouraged and augmented.

And so careful were our forefathers of preserving the freshness of the horse's mouth, with their riding horses, that the stable boys and grooms had their watering-bits allowed them for all purposes of exercising and leading out of the stable, in order that their rude and clumsy hands and little skill should not in any manner harden and spoil the horse's mouth; now so little jealousy exists on that head, that lads of every description belonging to a stable are seen going about with these wrenching-irons in the mouths of their horses, as commonly as with any other kind of bits. And the taste in these matters in Europe has actually declined and gone back of late years, instead of making advances with the advancing knowledge of other arts. The poor asses also, we may remark, are at this time not exempted, but to be in the fashion, are also tormented with these horrid irons.

Having a little exposed, in general terms, the onus to be removed, or the dilemma of the subject, we may now apply our views to a more distinct consideration of the actual apparatus inflicting it; but, before we do this, we could desire to add to the foregoing picture a few words on another instrument of torture of the bit kind that modern ingenuity has invented, and which has been successively increasing in severity from its first introduction, till it has become an annoyance to the worthy animal of a character the most atrocious, being a rein that no feeling of the hand is to guide, but an insensible fixed body, acting with any degree of tension and force against the bars of the mouth, that ignorance, whim, or cruelty may fancy to be necessary, crushing also the parts of the throat and of the windpipe, injuring and destroying them often, and mocking afterwards their miserable condition by the odious terms of pipers and roarsers, &c. It is the *bearing rein* we mean; so that not only is the poor animal to be upheld by severity of biting with the irons of the hand, but he is also to be teased by a mechanical force of unknown power and of no feeling at all, which is rammed with the other irons into his mouth, and then receives this unmeaning name.

This detestable scheme was unknown till of late years, and who had the honour of inventing it we know not, or even the nation whence it came, but we recollect forty years ago it was but in little use to what it is at present; and in France at that period so rare was it, that in a conversation I had with some of the professors of the Charenton school, it was with difficulty I could make them understand the thing I meant, but which at last they made out to be their *fausse rein*. It is now in Paris with the cab horses more severely used than in any other country, and with an almost total disregard of the feelings of the animal; and, though arming myself with all the philosophy I was able, to restrain too much feeling, I was at times shocked almost beyond all patience to see the abominable misuse of this villanous instrument; in Germany also it was in use in a way that made one shudder. I often in passing along had to exclaim, How is this excellent creature, who is so full of feeling, and ever willing to serve and to aid us, used by those called Christians, in defiance of all the mild precepts of that religion they pretend to, when his goodness and worth can pierce the heart of the untaught Arab, who would disdain for any consideration of gain thus to rend and abuse him. No mercy, indeed, is shown him here where the smallest interest, or even imagined interest, is apprehended to be concerned in his abuse!

This foul and unfair instrument, so easily abused, since no guiding hand testifies the pressure

of it, is inflicting pain, as I have said, with an unknown severity, except to the suffering animal himself, and is often acting in exact opposition to the other irons which the hand guides, and contains the reins of. And so usual has it become, and so cruelly misused, that it is, if possible, a greater evil than the whip, and the more grating because it passes unseen, and hardly obtains the least notice or commiseration. To what heads and hands are these measures generally left! And how do these men act, when the smallest real or even merely imagined pretence exists for these practices.

I know very well the want of safety in their horse's going will be urged as a pretence for it; but why not first rectify the shoeing, the cause of all this, and then see if it be necessary; and which now can be done on sure principles and without difficulty, as hundreds can testify.

And on this occasion I cannot forbear recording, that when in Germany, where I wrote many parts of this essay, I continually saw not only the most gross and wanton practices of cruelty with these lever-bits, but another most shameful practice also prevailing there, that of tying down the horse's head in draft service, with a cord or thong nearly to his breast, by a strap which passed from the bits in his mouth to a hook or ring at the lower part of the collar! being the very contrary in its direction to the bearing rein, but which it miserably represented in operation, but is only absurdly placed underneath instead of over the neck: this wretched cord is sometimes left of not more than seven or eight inches in length! By this measure he is not only severely punished all the time he is at work, but the use of his head and neck, which are eminently serviceable to him in his draught, is taken from him. Some hundreds of horses have I seen thus treated in that country, and generally among the lowest of the low, who were occupied in the laborious use of these animals, whose favorite plan it appeared to be, and obtained no sort of rebuke or reprehension. How can it be that the lowest and the most uneducated and ignorant of our species should be thus allowed ignorantly to tamper with, injure, and outrage the feelings of so noble a creature, in the very act of serving them! For it is a mere useless and gratuitous infliction upon an animal capable of the most generous affections, and fully as sensible of the wrongs that are done him as those inflicting them. A horse with his head held down by the bearing rein cannot move his neck to assist forward the fore limb, into which is inserted one of the most powerful muscles of the neck; and we may often see, after he has been so gagged and treated, that he is scourged severely because he does not go freely! In the gallop we may see, more particularly, how the head being thrown up and the neck stretched out, the fore legs are advanced forward by the exertion of this muscle, and the very great utility, advantage, and assistance they derive from its use.

And as to vices, it is by the concurrent opinion of the truly experienced in these matters admitted generally that patient measures and stratagem will do more in correcting them than violence and brutal usage, in nine cases out of ten; and this we may confirm ourselves from a long life spent among horses, and in observing them closely. In the year 1810, to relieve myself from severer studies, I took to breaking-in horses, in order to observe their tempers and conduct on such occasions, and their dispositions in respect to vice. And I found so gentle and temperate were they, that is if they have not been ill-used in bringing up, that they may be said to be, in a general way, nine-tenths formed by nature for the tasks required of them.

If laws are thought expedient to prevent cruelty to animals, why not also for biting him unfairly, which can be made one of the most cruel of all the modes of ill treatment.

We coax the horse to admit the bits, and hold out fair promises to him not to hurt him if he will but comply and be obedient; the horse agrees to the bargain and keeps faith, but how is it with the man—he violates it in every atrocious way! Although in a general way his docility is such that it almost outstrips our requirements, yet is he gagged in all directions, and treated worse than could be treated the most ferocious beast we can imagine! as though he of all others particularly deserved persecution!

We now quit these preliminary remarks, in order to consider the bits themselves, and also the true principles of the art of biting.

And in horse affairs, as in many other arts, I believe we shall do best to condescend to go back for models to ages long past; and perhaps in old Xenophon we shall find as good general directions in these simple matters as are to be found any where, or have ever since been penned; and who lived at the very remote period of about four hundred years before the Christian era commenced, and who was not only one of the first, but one of the best horsemen that the world ever saw. And on the basis which he laid down we shall erect our first principles, and maintain, with him, that in a general way the animal is docile and easily instructed; and, if this be allowed then is his biting easy, and any undue severity generally unnecessary. It is true there may be, and are exceptions to this rule, but they are so unfrequent that they must not be allowed to subvert or disturb its application, but such must be treated apart, and considered alone and by themselves. All the great and the good engaged in these pursuits have testified to the soundness of this writer; and the valiant Scipio modestly acknowledged that it was to Xenophon he owed all his principles of managing cavalry, and his wonderful successes in this way; and so well did Xenophon describe the manner of forming an efficient cavalry and of using them, that no one in Greece or Rome ever afterwards attempted to improve upon what he had written, or even presumed to touch the subject.

And who shall dispute the truth with us, that these things were better understood two thousand years ago than they are at present, or that Pagans and Infidels were more lenient in their measures with horses than we Christians of the present day. These difficulties and cruelties, it must be admitted, have grown in a great measure out of the destruction of causeways, and the adoption of iron rings for shoes to horses' feet of enormous rigidity and weight, which deteriorate the feet and punish the animal, and alter the whole system of the horse, humanity and all, almost rendering any desires that way unavailing and impracticable!

My feeble aid, therefore, has been extended to the consideration of these objects of bits, which after shoeing and whipping, is the worst torture the horse has now to endure; and we have been the more led to investigate the matter, since we were from much observation well assured that nearly all this suffering was gratuitous and unnecessary, and might be removed and laid aside by the intelligent use of the animal, and without our losing any share, but rather extending his beneficial services.

For myself, I could wish that my experience had been greater than it has been, my attention having been devoted to more difficult branches of the art in its present degraded state, in respect to the feet and shoeing, yet did I sometimes, in desire of better knowledge of the animal, as well as for relaxation from severer pursuits, as I have stated, turn my attention to this branch of the science, and ventured to break-in young horses with my own hands, in order to see and observe what degree of resistance they were in a general way disposed to make, and the conduct of them in this respect; and I found the difficulties had been much magnified by interested persons, to enhance the value of their services in this department. Patience and forbearance are leading requisites in it, and perhaps at times some little address, but, except on very rare occasions, nothing, I believe, that should justify much punishment, or the resorting to a cruel severity. It is indeed wonderful that so spirited, highly-gifted, and powerful an animal should so easily compound for all his natural rights, for such, I presume, every animal has, and yield so readily an abject servility to man, and the loss of liberty, and almost every natural desire.

May we not define the true art of biting to be the applying to the mouth of the horse such mouth-pieces and reins as shall be sufficient for the necessary guidance of the animal, and for adequate restraint when required, and that these be of the mildest kind consistently with the accomplishment of these purposes.

Laying the above down as a fundamental principle, we proceed to consider the proper mouth-pieces for the horse. We are tempted, however, from matter which we have collected years ago, to precede the commencement of these mere mechanical remarks by a very brief historical retrospective notice of the progress of this art of biting from its earliest period.

The Greeks acknowledge, as do also the Romans, that Erichonius the Egyptian, first taught them to break-in the horse for the chariot: "Primus Erichonius, &c." (see History of the advancement of Horse Knowledge, p. 5, London, 1824); and some antiquaries, versed in the Coptic or Egyptian language, have advanced proof of the word Erichonius being Coptic, and signified merely the horse-breaker, from *ere*, *facere*, and *ictho*,* horse, and that this general designation of a profession being personified by the Greeks, made their Erichonius; (see Smidt's Dissert. in the Archeolog. Trans. ;) and which derivation we think is very likely to be true. And the Roman Eridanus, or Eridamus seems to have been the same personage, or one holding a similar office, probably from *Eri*, the same prefix, and *domo-are*, to make tame. Thus the horses of Phaeton after his unfortunate expedition are turned over to Eridanus, "to wash their foaming mouths," and to put them in order again.

"Quem procul a patriâ diverso maximus orbe
Excipit Eridanus; spumantiaque abluit ora."

Ovid in Phaeton.

Next to him, and who was a real personage, came Simon, a man of Athens, spoken of and quoted by Xenophon, and did great achievements in this way. With his celebrated mares he won the prize more than once at the Olympic games, and left behind him in writing his precepts, but which writings are now lost, which however were used and quoted by Xenophon, adding

* Hence, perhaps, *icquo*, *icquus*, and *equus*.

to them what was necessary to perfect the art. A large mound, after the manner of the Greeks, was formed round the bodies of these mares at their death, as a memorial of their great achievements, and a statue or pillar with a bronze horse was erected to Simon in the Eleusinium, with his directions attached to it, enclosed, as Xenophon tells us, in the base; and Xenophon perfecting what Simon had begun in the art, little or nothing was afterwards added to their excellent instructions by either Greek or Roman, or were their precepts indeed ever called in question by these nations.

Xenophon everywhere inculcates the most gentle measures to be pursued with horses, forbidding any man in anger to approach them even. These are his words: "*Unum hoc præceptum ad equos, unus hic mos optimus est; ut equus iracundè nunquam tractetur. Nam ira nihil providet, sæpè numero designat ea, quorum pænitere necesse sit;*" (Leuncl. Ed. Xenoph. p. 1150:) words that should be inscribed in conspicuous characters over the door of every school for horses. The originals are: "*Το δὲ μὴ ποτε σὺν ὀργῇ τῷ ἵππῳ προσφέρεισθαι, ἐν τούτῳ καὶ ἰδῆγμα καὶ ἔθισμα πρὸς ἵππον ἀριστον. ἀπρονοήτων γὰρ ἡ ὀργή, ὥστε πολλακίς ἐξεργάζεται ὦν μεταμελεῖν ἀνάγκη.*" Xenophon Ed. Leuncl. p. 941.

He recommends a bit having the flexibility of a chain, and probably the bit they used was not very different from one. What would this great captain of horsemen think or say, if he arose from the dead, and got a sight by chance of a modern equestrian in our parks of pleasure, belabouring a horse's jaws by two iron levers of nearly a foot long, and with a distorted iron arch for a mouth-piece, and an iron chain under his chin as a fulcrum, to give it more effect against his bars? Surely his indignation would be great, and he would consider knowledge in these matters to have vastly retrograded since he left the earth, and inhumanity and cruelty to have much extended their empire. And the more so, as the horses of the Eastern world which he had to contend with were vastly more vigorous and fiery than our more temperate European ones. And yet in their achievements in war, as in all the other uses of the horse, have they perhaps never since been surpassed, if equalled.

Indeed, two nations of noble horsemen, dexterous in drawing the bow and managing their steeds, viz. the Numidians and the Parthians, appear to have never soiled or debased their horses' mouths with the iron, yet managed their fiery coursers with pre-eminent skill and address. What proof this of their intelligence, and of the extreme docility of their animals, and of the perfection, *gentil* perfection, they had arrived at.

We learn from the writings of Xenophon, that the Greeks had, in his time, an instrument in use which they sometimes employed in breaking-in their horses, and which appears not now to be used or at all understood; it was called by them the *πῆδη*, *Pede*, and was translated *Pedica*, in Latin, or *the Shackle*. Exactly of what nature this instrument might have been we know not, nor would it be easy even to conjecture, from such insufficient data as he has left us, even whether it was used in the mouth or to the feet, though we fully believe the former. To provoke others more skilled in these matters to the consideration and discussion rather than to clear up the difficulty of it, we shall here point out more than one passage where it is mentioned by him, and make some remarks upon it, as it is pity that any hint from such a quarter, should be lost on a department of horse-knowledge, which has been so neglected in these days, and deficient of intelligent instruction.

In the early part of his work on Horsemanship, in his excellent advice respecting the purchase of a horse, and the circumspection necessary in this important affair, he alludes to the use of the *pede*; and afterwards we find him, in a subsequent chapter, in a more particular manner to be speaking of, and commending it. "You must also consider," says he, "if, when mounted, he will go away from the horses he is with, or if he will run away with you on seeing other horses at a distance, and go to them. There are also other horses which, from bad education, run home of their own accord; and others also, with one side of the mouth disobedient, which is to be corrected by what is called the *Pede*, but still more so by changing the equitation." By this phrase is probably meant exercise with frequent turnings; for the passage itself seems to be somewhat briefly and obscurely worded, for changing the equitation with us would mean changing the whole manner or system of riding.

The Latin translator has it, "*Sunt etiam qui propter educationem malam ex ipsa agitationibus se fugâ domum recipiunt. Ex oris altera parte duriores prodiit (prodest?) equitatio quæ pedica nominatur; ac multo magis ipsa equitationis mutatio. Nam plerique sessorem auferre non conantur, nisi simul et ab improbiore maxillâ juventur, et impetus ipse domum tendat.*" P. 936, ed. cit.

In the next passage where this instrument is mentioned, which describes it more particularly, we cite only that part of it in the original words where the name *pede* occurs, that any of our readers, versed in Greek, may have the opportunity of considering it;* we shall however give at greater length the Latin translation, as being more generally understood, and as well expressing the general sense and context of the passage. The following we believe to be, as nearly as we can give it, the sense of the original, for he is treating, and rather copiously, on the best manner of turning and wheeling a horse about adroitly, and on both sides.

"And since it shall be more approved that the beginning should be made from the left, so it is best that he should begin there; if the horse, after being mounted, turns to the right, he should be threatened with the wand or switch, held up as a signal to him. However if he will take to the left, let him begin there, and after he has turned to the left, make then the beginning of the inflexion to the right. For a horse is accustomed, if turned to the right to keep to the right, and if to the left, the left. We however extol that exercising of the horse which is called the *πῶν, pede*; for it accustoms a horse to turn on either side the jaw. And it is good to change the

* "Και γὰρ πέφυκεν ὁ ἵππος εἰς μὲν τὰ δεξιὰ στρεφόμενος, τοῖς δεξιῶσι ἀφηγησάμενος εἰς εὐνοῖαν δὲ, τοῖς ἀριστεροῖς ἱππασίαν δὲ ἐπαινοῦμένην τὴν πῶν καλοῦμεν ἐπ' ἀμφοτέρω γὰρ τὰς γνάθους στρεφόμεθα ἐπιζῆ. Καὶ το μεταβαλλισθαι δὲ τὴν ἱππασίαν ἀγαθόν, ἵνα ἀμφοτέραι αἱ γνάθοι. Καθ' ἑκατέρω τῆς ἱππασίας ἰσαζονται. Βπαῖνοδμην δὲ καὶ τὴν ἐτερορρησὶν πῶν μᾶλλον τῆς κυκλοτεροῦς ἥτιον μὲν γὰρ οὕτως εὐαστρεφεῖτο ὁ ἵππος, ἥδη πλήρης ὢν τοῦ εὐθούς, καὶ το, τε ὀρθοδρομεῖν καὶ το ἀποκαμπτεῖν ἀμὰ μελετῶν αὐ," &c.

"Quum enim magis probetur, ut a sinistris initium fiat; ita maxime hinc incipiet, si equo post consensum, ad dextram currente, signum ei virga dederit. Quippe dum sinistram sumere vult, hinc incipiet; et ubi ad sinistram se convertit, tunc et inflexionis initium facit: Solet enim equus si convertatur ad dextram, dextris insistere; si ad levam sinistris. Eam vero laudamus equorum agitationem, quæ *pedicæ* nomen habet; nam adusefacit equos, ut ab utraque maxillarum parte convertantur. Et mutare motum equi bonum est, ut utraque agitationis ratione similes sibi maxilla fiant ambe. Laudamus et pedicam altera parte longiorum potius quam rotundam, sic enim libentius convertetur equus, jam recti cursus satur; et simul ad cursum rectum et ad inflexionem exercebitur. Etiam inhibendi sunt in reflexionibus Equi. Nec enim vel facile vel tuto fieri potest ut equus in cursu citatore pullo momento se reflectat," &c. *Xenoph. Ed. Leunclav. p. 943.*

motion of the horse to either side, that by working on both sides they may become equally easy. We approve that *pede*, with one side longer rather than one perfectly round: for with it will the horse more freely be turned, and when tired with one course, he is best inflected or changed to a straight course again. Also horses are to be tried in wheeling about; but this cannot be easily or safely done in a moment, when the horse is going fast." Xenoph. ed. cit. p. 943.

Having now afforded what information we can on this instrument used by the Greeks, in order that it may undergo the investigation and consideration which it appears to deserve, for we think any hint from so distinguished a master of the art is worth recording, so we shall now, if we may be allowed in our little experience to make a beginning in this way, to form some conjecture of the nature of it, in order to encourage others to the enquiry, rather than as solving the difficulty, we should say that we believe it to have been simply a ring that went loosely round or embraced the lower jaw, and which reached to the rider's hand by a cord or string, or the assistant's by a longing rein, and, from the expression "*ἐπαινοῦμεν δὲ καὶ τὴν ἑτερομήκη πίδακα μᾶλλον τῆς κυκλοτερούς*," viz. "we approve the *pede* that is made unequal, or with one side longer rather than those made round." We should be led to consider it as generally or as having been most often made perfectly circular or round, but that he preferred one lengthened on one side, which figure, we conceive, might bring it to that, perhaps, of an ovoid, or oval shape; the longer side or narrower end being used possibly for the attachment of the string, to which it would communicate a sort of purchase, and by twitching him with it at the moment he ought to begin the inflexion, a more decided impression would be produced in the direction it was employed. Perhaps this object, now it is once announced, may have light thrown upon it from other quarters, and finally be cleared up hereafter, that we shall desist from farther consideration of it.*

Xenophon, than whom perhaps no writer on equitation ranks higher, expressly lays it down as a fundamental principle that the bit which he calls (*χαλινός*) *chalinós*, should be formed of easy supple joints, so that its effect should resemble that of a chain, and with rather largish knobs to it, to make it the less severe probably by its more extensive bearing upon the parts. Such was the bit he used and recommended for all general purposes; but he further says, if severity be intended or necessary, "then these knobs are to be flattened and studded with rough prominent points." And although this severer bit be described by him fully enough for a common artificer who had never seen one to make it by, yet this rougher instrument obtains from him no properly distinctive name otherwise than as being *σκληρός*, or hard, and the other *μαλακός*, or soft, and it is six centuries after that we find by the writings of Julius Pollux and Hesychius, that these Greeks gave to this hard bit the term *λυκός*, *lukos*, and *λυπός*, *lypos*, after the Roman *lupatum*, or *wolf-bit*, in imitation perhaps of their Roman masters. Two centuries after this we find Vegetius, according to Sheffer's account at least, describing these rough points as two teeth proceeding from one iron stem, "*Ferrum in modo forficis dentatum*," or as being like the two points of an opening pair of scissors.

In a former edition of this work, of which I published but a few copies, I was led into the

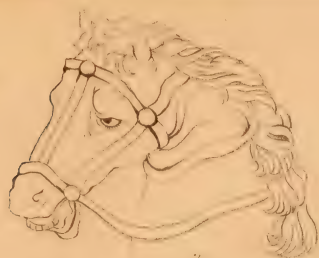
* Governor Pownall, and so did Beringer, consider this *pede* to have been a mere chain, see Horsemanship, p. 229, but from this latter part of the description, which they do not appear to have noticed, this would appear improbable, or rather impossible.

error of supposing, that as the ancients knew nothing of our modern curb bit, it was impossible they could have had any use for a chain about the chin: in this however I since find, from further research, I was mistaken; for, on referring to Julius Pollux, I discovered that they really employed a chain about the chin with the snaffles; the words of this writer place it beyond any doubt, they are as follows, το δε περί το γένειον ψάλλον το γις το στομα ἐμβαλλομενον χαλινος. Julius Pollux, Onomasticon, Ed. Amstelod. 1626, p. 100; signifying, as I apprehend, “the psellion passing round the chin is extending from the inserted mouth-piece to either side of it,” which I conceive to be quite decisive as to the fact, and is fully confirmed again by recurring to the description of Xenophon; yet as the curbed bit was entirely unknown to these nations, we were quite at a loss to imagine of what service could be this chain, on which we now propose to hazard a few remarks, the circumstance before, having that we know of, never obtained any attention or consideration at least. One of the offices to which it was applied was probably that of carrying the link or hook to which they attached their *ρυταγωγός*, *rutagogeus*, *lorum ductorium*, or conducting rein, perhaps at about its middle part, instead of applying it to the ring at the sides. Next, as they had not the slightest knowledge of our cross-pieces, they appear to have used it to prevent the bits from being drawn through the mouth, which was probably its chief office; and it would not indifferently fulfil such a purpose. Again this chain would have had the useful effect in case of the rider dismounting and leading his horse, of keeping the bits steady in the mouth, and of preventing the bit from leaving the tongue and lower jaw and striking against the roof of the palate, which is a great offence to a horse, as being an unusual and novel impression, and one of the causes which will occasion him often to run back if rudely pulled, as those much used to leading horses will have often observed. And lastly this chain would enforce more strongly the application of the sharp points of the *lupatum* to the tongue, if such were employed.

It is well understood that Julius Pollux flourished in the second century, in the days of the Emperor Commodus, to whom he dedicated his several books. He called this chain ψάλλον, *psellion*, which Xenophon six centuries before had given the broader name ψάλλον to. Xenophon orders previous to mounting, that the guide rein, *rutagoge*, be taken out of the psalion, which was probably a loop or hook of wire belonging to the chain, but not the chain itself; and psalion would rather signify, we apprehend, a wire or string than a chain, witness the Psalms of David, called so from the strings of his harp, and *psallo* signifying to play on a stringed instrument and singing to it at the same time, indeed the chain might have been originally but a simple chord, stretched across the chin to steady the bits in the mouth, when it obtained this name.

It is also not clear whether his *rutagoge* was a separate rein or not, but which we believe fully to have been the case, though his English translators have not made the distinction. We suppose it very similar to the piquet rein of the modern soldier, for leading by when he dismounts, or for fastening his horse to a post or chord in the open field or near the camp. On some occasions however, it is possible to make a pretty good guide rein, by a manœuvre we often see practised by the grooms of drawing the rein of the off side through the ring of the near side, thus getting both reins to the same side, when they become much more convenient for leading by.

We may here, also, in speaking of the reins, just remark, that they were very anciently called, as we see in Xenophon, *ραϊνα*, *tainia*, and *ρνία*, *tenia*, expressive, perhaps, of their being like



2.



3.

Ancient Bents & Bits taken from Trojans Column



Dug out of Silbury Hill.



5.



6.



7.



8.



The new Chain-bit.



ribbons or flat fillets of tape, or of flat strips of thong or leather, but in process of time it seems the *t* got omitted, and then they were called simply the *ηνία, enia*, and in this state gave rise to the splendid name of Heniocheer, the *Charioteer*, one who governed by the *ηνία, enia*, or reins, and *ἡξω, habeo*, the aspirate *H* being added to strengthen the sound, or rather the eta *η* expressed in capitals, being represented by an *H*, naturally supplied the letter; and hence perhaps the Latin word *habena* may have had its origin from *enia, ηνία*, and *habeo*, conjoined.

We see, however, in a passage of Xenophon after the preceding, that he recommends the rider not to lead by the common reins, which clearly indicates a separate rein to have been employed.

The lexicographers appear to have been a little at fault in explaining the term *upochalynidia*, found in the writings of Xenophon, and have interpreted it by "*ima pars fræni*," which we consider evasive, as not pointing to any individual part, and not true, at least if our conjectures be well founded, as to its being the lowest part of the bit. We apprehend, after duly considering their bits, that there can be little doubt the part they intended to denote by this appellation was the ring at the end of the bits on either side of the mouth-piece, which is common to every kind of bit, and highly necessary for the suspension of the bits in the mouth, and for receiving the reins also, which will explain every instance of its occurrence, we believe, in the ancient writings. The *υπο* appears here to have reference to its being situated at the extreme ends of the bit or mouth-piece, rather than to its being placed in the lowest part, "*ima pars fræni*." Camerarius appears to have first led the way into this error.

I ought not to omit to mention here, that the German translators of Pollux have constantly translated *υποχαλυνidia, upochalynidia*, by *orea*, or mouth-piece; a worse error, if possible, than the other "*ima pars fræni*:" and *φιμωσ* they also translate by *lupatum*; what it exactly was we have yet to learn, but believe an iron muzzle would more nearly meet the description in their accounts of it than any thing else we know of, but a *lupatum* certainly it could never have been. This long term *upochalynidia*, abbreviated into *upochal*, would be a convenient and useful expression for our use in English, for a part for which we have not any particular name, and which we can only speak of by a circumlocutory description of it, we therefore purpose occasionally hereafter to resort to it.

The ancients, as we remarked in a former edition, were certainly not acquainted with the use of cross-pieces to their bits, such as we see with our modern snaffles, and in their sculptured figures and representations we are continually presented with the appearance of a sullen-looking knob, sometimes above and sometimes precisely at the corner of the mouth, this we formerly apprehended could be no other than the means of attaching the bits to the mouth, and which seemed to be a brass hemispheric ball or rivet, which appeared to serve also the office of a cross-piece. An example of these knobs or bosses is afforded us in the two horses' heads from Trajan's column, copied from Scheffer, (*De Re Vehiculari Veterum*,) lib. i. p. 173, and given at Pl. 2, fig. 2, 3.

Now that these two horses were really bited, we may fairly presume from their mouths being partially open from their effects.

Also these knobs or bosses may be plainly seen represented in an ancient chariot-race inscribed to *Annia Arescusa*, a terra cotta tablet now preserved in the British Museum, and this race was with the quadriga or four-horse chariot; a well engraved copy of which, by my accurate friend

Sydenham Edwards, is to be seen in the frontispiece to my remarks on the "*Shoeing of the Ancients*;" London, 1831.* On examining these bosses with attention, they appear to be wholly attached to the headstall; how the reins or bits were attached to them is not evident, by a short iron rivet inside, or probably by a loop proceeding below them, and carrying a ring which received both the bit and the reins; future researches may confirm this opinion, or perhaps remove it.

These have been to me, and I suppose, and indeed from their writings it appears so, a great difficulty to others to understand, but the true solution appears to be, and we shall give proof of it presently, that these knobs were really rivets, but which did not immediately fasten the bits, but carried an iron loop which suspended them in the mouth, by passing into a ring for this purpose. And that such rings existed we are assured by the words of Pollux, *κυκλοὶ σιδηροὶ, annuli ferrei*, or iron circles. Still no mention appears of the above iron strap that we remember to have seen at least.

Now the reason of these iron parts being omitted in their ancient figures, can only be explained by supposing that as grand effect was only wanted, and with the least possible trouble, so they did not descend to the representation of these iron minutæ as being attended with great trouble, without contributing much or at all to the effect, and the chain also was omitted probably from the same cause. Now, however, as the circumstance of one being present is known, the eye will be more ready to discover it in future researches, and we may be able hereafter actually to show an instance of its being represented.

The learned Scheffer has considered these knobs or bosses as the true *curcumi* of the Greeks, we are however of quite a different opinion, and consider them only as the melon and olive-pieces or rollers, on the bits of the present day; accessories of more value to the artificer perhaps than to the horseman.

We propose now to verify our observations on these bosses and other parts of the ancient bit, from direct examples, which, however, are more rare than might be expected. Beringer gives us a representation of what he considers an ancient bit, Plate VII. fig. 4: he favors us with no remark however upon it, further than that it was dug out of Silbury Hill in Wiltshire, a huge mound in the road to Bath; the account is probably taken from some communication to the *Archæologia*.

In attempting a few observations on this curious article, we should first of all remark that it has

* Although I have contemplated from time to time for years this interesting antique, yet I never till now was led at all to the suspicion that this triumphant charioteer must have really been a female.

This I conjecture from several strong circumstances: the first is, that the superscription, when properly translated, is to *Annia of Arescusi*, evidently a female name; secondly, that the doubled visage served to imply that in these performances she wore a mask, and which appears to have been that of a handsome young male person; thirdly, the very numerous folds and swathings apparently of the reins round her body, almost from top to bottom, and which appeared very natural as aiding her to direct her fiery couriers, yet were at the same time as efficiently serving the office of concealing the female lineaments of her person, which to one engaged in so active and masculine an exploit would have otherwise had a somewhat uncouth appearance.

History affords no clue that I know of to the performance of this equestrian heroine; but, should any of my learned readers be acquainted with any allusion whatever to this name or race, they will afford me a high gratification in communicating it either publicly or privately.

Under the article *Arescus*, in Ainsworth's Dictionary, is the following singular account: "αὐ ἀρῆσκω," "one who had been a woman, and was afterwards turned into a man, and was married to a woman."

all the appearance of having been found in detached pieces, probably from the destructive effects of rust and time, and that these pieces have been carelessly thrown together by the draftsman perhaps, in preparing them for representation. The smaller œlet at the top, see Plate II. fig. 4, we suspect to have been the holes for riveting it to the leathern headstall; a shortish pedicle or shank of iron proceeds from this œlet downwards, to a larger one, which we should consider in this bit as the upochal. The mouth-piece is that of a simple snaffle, jointed in the middle by two plain rings introsuscepted; and the other, or outer extremities, are with rings also, and rather larger. But the greatest curiosity of this bit is the singularly formed cross-pieces, being of a sigmoid or s like figure, and from the presence of which, we are led to conjecture that it is not of ancient, that is of Greek or Roman, workmanship, they being unacquainted with the use of these parts; their singular form however, and awkward manner, would lead one to suspect that it was a very first or early essay or attempt of the kind. The shorter œlet, that on the left, is improperly placed on a branch of the cross-piece, and appears to have been used for the psalion or chain, or perhaps for the receiving the reins lashed to them by rivets, or held by an iron rod passed through, and being reflected back on the rein was riveted.

We forbear further remarks on this singular apparatus, placed together in so imperfect a state as its two sides evince, by being so palpably unlike. Of the chain under the chin there is no vestige left, if there ever was one, and it certainly from rust would perish in a damp place, before the other parts. We shall only further remark that if Silbury Hill as it is called, received its name from being the burial-place of old King Coel, or Cole, of joyous memory, in Latin perhaps Coelius, and corrupted into Sil from resemblance of sound; then might this have been the very bit of his horse, and a very great curiosity therefore; but whether it be so or not, we should, from all the circumstances attending the bit itself, be inclined to date its period about the time of the Saxon or Merovingian dynasties.

We now are enabled through the kindness of our friend, Dr. Hodgkin, who procured us the work, to exhibit another specimen or example of an ancient bit, which we believe to be of a date long anterior to the former; and it is copied from the learned work in Latin of Invernizi *De Franis*, printed at Rome, 1785, octavo, the bit itself was discovered among the treasures of the Borgian Museum at Velletri, near Rome. We ought however to state previously, that Beringer has given us another figure of what he considers an ancient bit, and which we have copied into our second plate, fig. 5, and which, after due examination, we rather incline to believe is not a bit, but the framework of a large Roman fibula, the tongue being gone, there seems no means of connecting it with the other half, if there ever was one, and we suppose it intended for fastening a Roman cloak or toga, or perhaps for the curtains of some large apartment or tent, we shall therefore pass it over.

This Roman bit, fig. 1, we are disposed to believe is a very truly ancient bit, Invernizi supposes it of the date of the Christian emperors, and

Fig. 1.



perhaps it is still higher than this; the total absence of cross-pieces, it being a snaffle, disposes us the more to this belief. We propose now to analyse it more closely.

The two pieces which form the mouth-piece are of the most simple character, united in the middle by a plain two-ring joint mutually received; the ends or outer extremities of these pieces are carried through a perforation in a plate of iron, and then curved into a circle, preventing its return; to which circle is appended a thicker and larger ring, which here plays the part of upochal in receiving the guide reins of the hand, and to it also are appended two smaller ones, one of these we may suppose might have carried the chain or psellion, the other possibly the rutagoge or guide rein, it is true both might have gone very well into the upochal, but as it is likely to have been the bit of some distinguished character where expense was no object, a multiplication of parts, one for every different office might suit better with the views and interests of the maker than a more simple one. They may, however, have been merely for ornament as has been before supposed.

We next have to notice with a considerable degree of satisfaction the œlet plate for the attachment of this bit to the headstal, and suspension of it in the mouth. Here it is done by two eyelets, and there is also an oblong opening or slit in the middle part of this plate which might have been used for the same purpose of fastening it more securely, or rather perhaps was given for lightness and ornament.

This most ancient bit contains all the real essentials of a bit, and is perhaps the most simple instrument of the kind to be seen. It is not only the plainest, but one of the smoothest bits that it is possible to form or conceive, yet Invernizi strangely calls it a *lupatum*, and uses that term throughout his work for all kinds of bits, rough or smooth.



Fig. 2.

Fig. 2, is also from this same writer, and is supposed by him to be an ancient *lupatum*, there is little doubt of its being so, and therefore a great curiosity. It is almost too much rusted and confused to make out anything very distinctly, but here we apprehend we see several of those parts of the furniture the ancients were pleased to call *curcumi*, *oboliskoi*, *oboli*, *trochoi*, &c.—*et id genus omne*, with their *echinoi*, or points. And as false quotations are an abomination that should be repressed, as greatly adverse to the spread of true knowledge, so Invernizi's reference, at p. 103, to Vegetius, concerning the *curcumi* of the Greeks, is wholly unfounded and false. The word "*corbem*," employed by Vegetius, lib. 2, ch. 33, having evidently no reference at all (that we can see at least) to any such thing. A sort of enlarged, and involuted joint, appears in the middle of this bit, and the two ends or extremities of the mouth-piece are provided with thick knobs of perforated iron, to which it is not clear how the reins were intended to be affixed, perhaps by a piece of iron coming through these perforations and then riveted, nor is its suspension to the headstal in any way indicated by what is here presented to us.

We have now given evidence enough, we apprehend, to prove that these bosses were a kind of rivets for the suspension of the bits, and when there was a *Musrole*, or nose-band, crossing the headstal, which was generally the case,

that was also secured by it at the same time. So that the lateral strap of the headstal did not extend down to the upchal or ring at the side of the mouth, and placed in the axis of the bit, as with our modern snaffles, but this extension was effected by a link, an ælet-link, or cheek-plate, if I may give it this name, which reached to the mouth. And thus is explained a difficulty that had been to us and to others no small trouble, more so than now it is solved could have been believed, for it is simple enough when known, like many other mysteries.

The mind's eye once awakened, can see things before quite invisible, and my worthy and intelligent friend, Dr. Frankum, of Lisson Grove, making a tour into Italy, and awake to the question, furnished me by his researches with useful matter confirming the above views. At Naples he saw the noble equestrian statue of the Emperor Aurelius, and the head given in the margin was a light sketch of it, taken by his pencil on the spot.

In fig. 3 are seen two of these bosses of an immense size, so large indeed, that they could not very well be rivet-heads, as in the former instances, and an oblong perforation or slit appears in the centre of these bosses, further evincing their unsolid nature. These bosses also have a rounded prominent rim or margin.

Now the bits appear to pass within the cover of these rounded plates, for such they appear to be, and are probably held and fastened there by some catch or bolt, which the oblong notch affords the means, by the admission of a key or stylus, of setting at liberty again.

These notches I at first apprehended might perhaps be intended for the insertion of ornamental trappings of metal, silk, or worsted, but rejected that notion on reflecting that as the emperor was on this horse, and supposed to be in public, so the horse would most probably be dressed in full costume, and caparisoned in all respects for the purpose, and therefore complete as he is here represented.

Similar plates appear also in front of this head, having a prominent rim or margin of metal round them, and are variously figured, which would appear to show that they are chiefly for ornament. And we think it likely that they were of highly-polished metal, perhaps silver or gold, and by falling down as from an hinge, they enclosed and concealed the otherwise exposed ends of the bits and the head-gear, where these joined each other. And these covers were made fast perhaps by a clasp or spring-catch, which could at any time be released for the cleansing or polishing of these plates, by a key introduced as we have stated, through the above notches.

How the bits were connected to the headstal strap within these bosses can only be conjectured. However, by rare accident, we are in possession of some clue to this affair, for my worthy friend, in descending, and searching the gloomy ruins of the subterraneous Herculaneum, was there shewn a horse's bit, a copy of which he sketched on the spot with his pencil, and which will go a good way in explaining what we observe. See fig. 5.

Fig. 3.



Fig. 5.



On referring to figure 3 of the horse's head, we see a ring on the side of the mouth larger and more distinct than usual, and the same is presented in this bit.

Two rods of iron or thick wires are seen proceeding from this bit (see fig. 3) upwards, to enter the boss; this appearance was quite inexplicable till we saw the Herculaneum bit, where beyond the ring or upchoal the two rods are forming an open square, which square frame is destined apparently to give lodgment, first at its upper or top bar, to the headstal, and next by the two lateral bars to the musrole, or noseband, which we see going to these points; now these joinings covered over are then concealed from view by the plate.

It is also to be remarked, that the destruction of this unfortunate city took place at no very distant period of time from the reign of this emperor, so that the same practices in respect to these matters it is likely were prevailing in both cities at this period, and renders our conjectures the more probable.



Fig. 4.

Fig. 4 is a front view of this horse's head, where we observe three of these plates apparently covering over the different joinings of the longitudinal strap proceeding down the front of the face, and which plates are all provided with an oblong central aperture. The foretop of this horse is curiously wrought into a large conical tuft, with a smaller one at its extremity, the fashion perhaps of the times in dressing this part. The other day, however, in casually opening a volume of Addison's Spectator, vol. ii. Essay No. 59, we observed he makes the remark that this tuft was supposed to represent the figure of an owl, "to intimate the country of the artist, who in all probability was an Athenian:" the statuaries being forbid at that period by some foolish law, to put their names upon their works; and so ingeniously devised this expedient to make known the place of its birth.

This Herculaneum bit we see is also entirely without cross-pieces, and has an oblong square piece of metal in the middle of the mouth-piece, intended to rest upon the tongue, this part has been called by Pollux, the *νηϊον*, *enion*, and is derived, as Scheffer observes, from *νηϋω*, *jungo*, which rather should apply to the joint itself; and as this interposed piece of metal especially rests on the tongue, we have taken the liberty in our own bit, where a similar piece is found, but considerably more flat, and with perforations for points, (if such should be deemed necessary,) to call it the *Tongue-piece*, for there is a striking resemblance in many respects of this with our own bit, see Pl. 2, fig. 9, which bit however was in use by my friend more than a twelvemonth before his proceeding to Italy: although I acknowledge it was my wish in forming that bit to adhere to the maxims of Xenophon, and to put his rules into a more accordant practice than even these ancients appear in a general way to have done. We may observe, it is to this middle piece or *tongue-piece* that all the players, toys, and trinketry (*υποστοματα*) *upostomata*, of the ancient bit were attached.*

The last remark we shall have to make on this splendid furniture of Aurelius, perhaps the

* This same piece, when flattened and armed with obtuse points, bore the name of *τριβολος*, *tribolos*, from its resemblance to the Roman *tribulus*, a heavy sort of wood frame or kind of harrow, with numerous blunt points or knobs for beating out their corn, being dragged backwards and forwards on the floor, the corn strewn upon it, and hence probably our expression of being under *tribulation*!

most so of any ancient example, is this, that on removing the headstall, the insides of these bosses would become exposed and accessible even to the fingers, and therefore not requiring any key or stylus to set the bits at liberty. It is also possible that these notches afforded opportunity of duly adjusting the bits after they were placed in the mouth, which we may remark would be still better accomplished by lifting up the entire plate, a hint perhaps for modern artificers.

Whether in this elaborate representation of ancient horse furniture can be found any appearance or indication of the chain which should appear beneath the chin, we know not, as my friend not having then been aware of the existence of such a part did not particularly look for it; in different small casts of this statue in plaster of Paris they do not exhibit it, nor did we hardly expect indeed to find it with them. And we may easily see that with this chain they only wanted a piece of iron rod or stick thrust through it within the encircling iron to constitute a curbed bit, so near were they to this matter, but most fortunately for the animal the application of it did not occur for several centuries after.

Before terminating this view of ancient biting, it may be worth a remark, that the mouth-piece of the bit was called by the Latins, *orea*, from *os*, *oris*, *the mouth*, and hence the charioteer was termed by them *auriga*, as commanding by the *orea* or mouth-piece; from *orea*, and *agere*, *to act by or with the ore*, which became singularly corrupted or purposely changed into *auriga*, perhaps for more easy pronunciation, or possibly to avoid a too close collision with the word *origo*.

Xenophon always used the term *Χαλινος*, *Chalinos*, for the bits in the mouth; he also extended the same term to the reins, and he used it for both conjointly.

From this word *chalinos* therefore we have presumed to coin a general term or appellation for the whole art of biting, intending, that is, if there be found no valid objection, to treat of the entire business of biting under the head of *Chalinologia* or *Chalinology*, an art or practice surely of consequence enough to mankind to well merit and deserve a proper and separate designation, and which in time will perhaps bring about, at least it is to be so hoped, a more scrupulous and enlightened examination into these affairs, and set things a little to rights which relate to it, by the enforcement with the public, of sound, benign, and wholesome laws, instead of the abused, dabased, and shamefully exercised practices in vogue at present. The appellation *chalinos* is without doubt obtained from the word *Χαλκος*, *chalcos*, *brass*, of which metal doubtless these instruments were originally made, till at length iron being obtained with more facility and abundance, superseded its use.

Of the Latin word *morsus*, which appears to afford us no titular prefix for the art, we may remark it but very rarely occurs in Latin writers, whether it was avoided by them from its uncouth meaning, or from any unpleasant allusion, known only to the natives, but so it is that it is truly rarely seen, *frantum* being usually substituted for it: elegance of diction perhaps, may have alone been the cause of the more frequent use of the latter term.

We here conclude our account of ancient biting, which is indeed truly brief and simple, for there does not appear that we are yet acquainted with, any suggestions of consequence on this art after Xenophon, till the introduction in the sixteenth century of the instrument from Italy, which we shall have to enlarge upon hereafter, called the chain-curb bit.

On the General Principles for Biting the Young Horse.

In what should consist the general principle we have already stated, so that it will not be necessary here to repeat it, but a few prefatory remarks on some very vulgar phrases continually employed by those occupied with these arts, and which may continue, if not explained, to lead to misconception and evil, appear to deserve some attention in this place.

In England it is usual to call the educating of the young horse *breaking him in*, and it is, as we from sad experience know, but too frequently lamentably the case, that he is indeed broken-in, and in the literal sense of the words,—that is, deprived of all his noble energies, and subdued and destroyed, with his limbs racked and damaged by violence in such a way that he is of little value ever after, and often made a most miserable object indeed. Instead of his education being conducted with due care and that science which it merits, and with an intelligence and knowledge of the structure, faculties, and habits of the noble creature whose instruction he undertakes to superintend, and which information is indeed necessary to render him the glorious object we are seeking for our use, and for the avoiding those evils, which we may remark especially occur in difficult cases, where there is perhaps a more than usual energy in the animal, and which animals are often indeed the most valuable of any, when suitably prepared and presented to us : that we could wish to see the words *enlightened education* supersede the terrific phrase of breaking-in, as leading to a more just view of the matter, and education is indeed the very word employed in ancient times, and by other nations.

There is another phrase also, scarcely less gross and exceptionable, perhaps even more so, and which leads to strange misconceptions and injurious consequences often in his treatment, which is that of "*tendering the horse's mouth*," directly leading to a false impression of what should be the nature of this tendering process, and by the abominable severity of a laceration and cruelly scarifying the mouth, as being the readiest and quickest way of obtaining this supposed tender state, occasion them a real injury. And thousands have been thus flead and scarified in consequence, and rendered haters of man's dominion ever after: the mouth being filled with unsightly scars and lumps, with a deranged and hardened sensation; thus also making their tasks painful and ungrateful, instead of the parts being properly alive and sensitive, and aiding in the proper functions of the bit.

We should from our own experience, which has been of some date, and practised with a close attention to and observance of, the real effects of these instruments, be of opinion that the mouth cannot be kept too entire and fresh for the full use and effect of the bit; and that it is our duty also to inculcate such doctrine, and widely different views and measures for the obtaining this end; and that the thing we should aim at in obtaining this tenderness should not be by the lacerating and scarifying of the mouth, but by the employing a different doctrine and views altogether, and that our lessons should have for their object to impress indelibly upon the animal the omnipotency and irresistible nature of the bit, and that it was every way to his advantage to yield an obedience to it; and this by a stratagem that has been before employed, though perhaps not hitherto taken up in the full scientific manner, and on those principles we could desire to see

it done, so that the animal should be at all times glad to recoil, if permitted, from their operation on his mouth: we speak of it in the hope that by such views we may at last be led into some amelioration in the biting of the horse, instead of the cruelties we have just had to notice.

I am ready to admit that a degree of severity might be necessary with some individuals at the commencement of the application of such a system, but that something like the above principle ought nevertheless, as I believe, to be laid as a foundation; for by it I understand the forcing the animal upon the bits, immoveably fixed in a machine or between two firm pillars, and which has been by some called *pillaring* the horse; and for rude and insensible mouths such would overcome the hardest, but very gentle and temperate measures would, I am convinced, be all that would be necessary to mouths in general, or the using the hands only, or reining them up a little, but, in cases of obduracy and difficulty, the above proceeding would reduce them without injurious cruelty, or its being pursued to a laceration of any kind.

The pillaring of the horse is by no means, as we have stated, a new idea, it having been long since acted upon, where there was convenient opportunity for it, and such in every considerable town where many horses are kept should be provided; it simply consists in placing the reins with their bits loosely to two pillars, between which the horse is brought and forced upon them by a stroke behind: running forward, he meets the bits and recoils, when he can no longer bear their impression; and dealt with sharply, but with great discretion, he is brought to admit their efficient and irresistible nature, a delusion which, like many others in his education, becomes permanently impressed, at least as far as obedience in a general way is concerned. The chief art in doing it, for it ought to be a profession and study of itself, is in tempering the severity to the disposition and nature of the individual subjected to its operation, and the degree of susceptibility and feelings of the parts of the mouth concerned. Such is the basis we propose: ameliorated by practice hereafter and duly understood, it would, we believe, become of extensive utility and benefit. For the present mode we know frequently to end in the ruin of many fine young horses, and that the coercion and severity of keeping the neck and throat for a long time bent and crushed into a narrow compass, reined up to a fixed machine, or wooden figure, has been such as that the parts have taken to inflaming, and which has ultimately destroyed the animal: this actually occurred within the knowledge of a friend of mine to a horse in Gray's Inn lane, which had been thus shamefully abused.

Different cases certainly might require different modes of proceeding, and different instruments, or differently modified ones, but the broad principle appears to us to be somewhat in this direction. What a reproach to us is the ancient simplicity of attaining these objects; for there is no doubt in their quadriga races the utmost obedience of the animals must have been obtained, and by the simplest bits. And how simply do the northern nations at this day, as in Sweden, manage their spirited little rapid steeds, with the simplest bits, of which we have had an ocular witness in the accounts of that most exact and entertaining traveller, Dr. Edward Clarke, of Cambridge. See "*Travels in Sweden and Norway*," vol. ix.

Somewhat of a principle for the art being now laid down, we shall next proceed to discuss the instruments employed in its exercise.

A Description of the different Kinds of Bits.

The art of biting horses may be said to consist in furnishing the mouth with the most proper mouth-pieces for obtaining from them an obedience to the will of the rider, and exacting a due performance of all the movements and restraints which may be desired, or which at least are dependent upon the operation of the reins. Rightly understood, and well administered, this art affords the power of communicating to the horse support and confidence, with greater ease and security to the rider. The misapplication of its rules, on the contrary, or an inattention to them, where the mouth is not totally insensible, will produce painful sensations to the horse, with disgust and rebellion, and to the rider uneasiness, and perhaps danger.

It is to be lamented that the presumptuous opinions of the uninformed have been too much the guide of the public in their estimation and choice of the proper bits for horses, as also in too many other things respecting these useful animals, tending often to accumulate unnecessary suffering and misery upon them. The writers on this subject are but few and unsatisfactory; we shall, however, except Berenger, whose work is a valuable effort to emancipate this branch of science from barbarity and ignorance; and from him we shall take occasion to make some extracts in the sequel of this article. Here it will be proper to observe, that this author, by the term *bit*, has designated the curbed bit only; but we have ventured, for the sake of pursuing a more easy and connected view of the subject, to include in this term any piece or pieces of metal whatever which are placed in the horse's mouth, for the purpose of guidance or restraint. For those more simple mouth-pieces called the snaffle must have borne the name of bits long before the invention of the other complex instrument, which he is pleased to call a bit, so that of the two the snaffle is by right the more entitled to the term. And it certainly is as much a bit in any proper sense or signification of the word as the other; and by thus bringing the whole family into one and the same denomination, all mystification is removed, and they become more easily considered and examined, and their differences and qualities pointed out; every instrument therefore, that goes between the jaws of the horse, according to our definition of the word, is a bit.

In this account of the different kinds of bits, and their effects, we shall begin, for the sake of order, with the description of a bit of the most simple construction possible, and proceed afterwards to the most complicated.

A short iron rod, made rather wider than the mouth of the horse, and provided with a hook or ring at its extremities for the reins and fastening the headstall to, affords us perhaps an example of the greatest possible simplicity in the construction of a bit; and such a one only slightly curved forwards, to allow more liberty for the tongue, is the one at present in general use for the heavier kind of draft horses, and to which the bearing-rein is also usually attached, and which is then passed over the hames of the collar, and such may be called *The Simple curved, unjointed Bit*.

A rod similar to the former, but broken into two pieces, and connected by a joint in the middle, is the next in point of simplicity, and is in common use for horses of light draft, as

those employed for the chair, curricie, or coach, &c. and is usually attached, not to the reins but the bearing-rein going to a hook in front of the saddle, which kind of bit is then mostly termed with us a *bridoon*, from the French, *bridon*.

The *Common Snaffle Bit*, the next in point of farther complication of parts, is also made of two similar pieces conjoined, and which can scarcely be said to differ from the former, it is provided with two straight longish cross-pieces, which rest exteriorly against the sides of the mouth; for as the snaffle is intended for the saddle-horse, and the reins go to the hands, so these cross-pieces are necessary to prevent the bits from being drawn through the mouth, but which precaution is not so imperatively necessary where the bits are affixed to a bearing-rein. The *bridoon*, however, we may observe, is also made in general much smaller than the snaffle, and is without, or with only very short, cross-pieces.

The distinction however, between a *bridon* and *snaffle*, is truly insignificant and of little consequence; for on all occasions cross-pieces are the most convenient; it will therefore be easily seen, that the *bridon* is merely an imperfect and lighter snaffle, possessing no peculiar properties which can be said to form a real distinction, and ought to bear the name of the *lesser or little snaffle*, or *draft snaffle*, or *snafflette*.

The term *bridoon* also, when used to this object by us, is misapplied; for the French, from whom we have borrowed it, by *le bridon*, understand the snaffle and its rein, in opposition to *le Bride*, by which they denote the *curbed bit* and reins. For in war, and on other occasions, the *bridon* or snaffle was used by them as a lesser bridle, or bridle of reserve, in case of the failure of the former from any accident; and hence the origin of its name, *bridon*, being the diminutive of *bride*, and perhaps a contraction of *bridonette*, if there be such a word. An ancient *bridon* cased in armour is seen Pl. 2, fig. 3.

The number of parts of which the mouth-piece of the snaffle is composed may be increased to any extent, and it may be made with one, two, or several joints; but as it is evident these changes will not essentially alter its properties or effects, except in rendering it a little milder, by being more flexible, so it would be useless to pursue a distinct consideration of them on this account.

But the condition of the snaffle admits of being so altered and changed by the variation of its figure, its substance, and its surface, as to acquire quite new properties and effects, which will require particular attention; since its gentleness or rigour will depend wholly on these conditions. A mouth-piece made of two entirely straight pieces will be more severe than when these are somewhat curved, as the curved bit is more apt to embrace and include the lips, or inside lining of the cheeks, between it and the bars, than a straight one, and it also occupies rather more surface of pressure, and is somewhat less sudden in its operation. A thin and slender bit or snaffle, it will be easily perceived, will also rest with more severity and sharpness upon the bars than a thick and obtuse one; the former therefore, or the thin bit, is employed more particularly for restraining such horses as are hard-mouthed, and too eager, while the latter is used for such as have a proper feeling of the bars, and especially for breaking-in young colts.*

* It must be obvious also that a very moderate sized bit flattened, would occupy as much surface of bearing, without the increased weight of a perfectly round one, and thus save the mouth from the suffering of a heavy mass of iron.

Its surface also may be varied *ad infinitum* as to roughness or smoothness, producing different effects. To give the greatest ease possible, a rather large and highly polished bit is necessary. This is sometimes provided with rollers moveable on the axis of the bit, which turning with every movement of the reins, diminish the friction of the bits, and render them less irritating. These rollers however, in reality, can have but little effect in the snaffle, though of useful effect in the mouth piece of the curb; for this reason, that the snaffle being jointed in the middle, is drawn by the reins to a sharp angle in the mouth, so that these rollers are presented to the bars in an oblique direction, under which position it will be obvious they can have very little or no motion, but, on the contrary, will tend by their irregularity to render the bits more severe; so that a well-polished snaffle is in fact preferable to one of these with rollers of an ordinary construction.

On the other hand, to give the greatest degree of severity to the mouth-piece of the snaffle, it is made square, and twisted whilst hot into a spiral form, and so is made to present a succession of sharp, rough, and unequal surfaces, or cutting edges, to the jaw, and capable, according to the degree of sharpness to which these edges are wrought, of punishing the bars and lips with very great severity. The different degrees of punishment which this kind of bit is capable of inflicting will perhaps be found sufficient for all the purposes of correction, where recourse may properly be had to actual force and punishment. For it should be always kept in view, that gentle means will produce and keep a good mouth; whilst harshness and too great severity will tend to destroy it altogether.

Beyond the changes above described, the snaffle itself does not appear to admit of any alterations worthy of notice. It may however be just observed, that some horsemen add a chain to it, extending from cheek to cheek, which resting loosely on the tongue, produces irritation and slaving, and, as they imagine, freshens the mouth. Such a bit is known by the name of the *Rockingham snaffle*.

Also sometimes we have seen a large ring passed through the ends of the bit, these being enlarged to receive it, and then there is no cross-piece, the ring serving that office, which is a very simple form, and handsome in appearance, and being made of steel, hardened and highly polished, retains its polish with very little trouble, and is perhaps one of the best and simplest forms that the snaffle admits of. Such may be called *The Ring snaffle*. The straight cross-pieces are also liable to injure the cheeks which these rings are not. The ends therefore of such straight pieces should be a little curved away from the cheeks; from the want of attention to this I have seen horses much annoyed. These appear to be all the bits of the snaffle kind worthy a serious notice.

Now as to the source of our term snaffle, which does not appear to have been much understood by the lexicographers, and Dr. Johnson, in his Dictionary, has given us the Dutch word *Snavel*, for its origin; which is indeed an equivalent or corresponding term used in Holland, but is by no means any account of its real derivation. We shall, I believe, seek its source with more success in the old Norman, or French word, *Ganache*, signifying the jaw, or jaw-bone, and from which we certainly obtain our English verb, *to gnash*, as with the teeth; and from

this we apprehend was formed the word, *gnashtel* or *gnashle*, for the thing ground between the teeth, or gnashed upon, and afterwards for more easy pronunciation, for the word was certainly somewhat rough, we obtained *gnaffle*, and for still greater ease of pronunciation and a better effect, at a time when writing was not much in use to fix the word, we get it to *snaffle*; such we are disposed to believe has been its genuine origin.

The French word, *Ganache*, is also clearly a derivation or co-term of the Greek γναθος, *gnathos*, the jaw; and in *gnash*, as also in Shakspear's phrase "*the gnarled oak*," we have the original *gn* still preserved, but in the word, *snarl*, the *gn* is changed for an *sn*, as it is in the word *snaffle*; for there can be no just reason for doubting that they were all derived from this one stock, or parent, *Gnathos*. A Frenchman unable to pronounce the *th* in *Gnathos* changes it we see into *che*, thus making of it *ganache*, giving it however the sound of *sh*. And we in adopting the word follow the same sound, but render it more truly by the proper letters *sh*, as in the word *gnash*, &c.; this is not all, we make of this noun a verb active, which then becomes the parent stock of a numerous progeny of small, but expressive words we could ill dispense with, though some of them are so changed, and *snaggy*,* and *gnawn*, that even a profound lexicographer can hardly recognize their noble Greek descent.

Of the reins of the Snaffle, and Snafflette, or Bridoon. It is to be remarked, that the reins attached to the snaffle always go to the hand, but those of the *snafflette*, or *bridoon* as it is falsely called, admit of various alterations in their disposition as to their being carried higher or lower, which will materially influence their effect upon the mouth, and at this present time there is a practice more especially in horses of light draft, as in those for carriages, curricles, and chairs, &c., to divert and change the direct course of the bearing rein in going to the hook of the saddle on the horse's back, by directing it up the sides of the face, as high nearly as to the parotid gland, or base of the ear, where it is passed through a ring hanging from the headstal, and from thence is directed to the saddle. The appearance is thought ornamental, and the reins so disposed are considered as more forcibly elevating the head than if they proceeded to the back in their natural course. It is, however, but a bad plan, since it tends to draw the bits from off the bars, where they ought ever to act, and to bring them over the grinder teeth, and so direct them against the corners of the mouth and cheeks, producing a distorted unsightly appearance, and an improper appui or bearing of the bits upon these parts, the bars, where as we have said to produce a good impression, they ought always to rest.

The crooked angular direction of the rein has ever appeared to us more fantastic than elegant, and the practice is certainly inconsistent with the principles of sound horsemanship or biting. This sudden angle or turn of the rein will also induce a stronger pressure towards the point of deflexion, viz. that part of the headstal next the ears, the part least agreeable to all horses to be much pulled at or pressed upon.

As the bits themselves, so these appendages of the bits admit of almost endless variation. And the manufacturers of these articles availing themselves of this licence, render their business more lucrative by as frequent changes as possible; which are successively introduced as fashion-

* "Snaggy, of this word I know not the etymology or original."—*Johnson's Dict.*

able novelties, till again for novelty they return to the simplest practice, the most complex arrangement however as might be expected has now but too long prevailed, and we may hope therefore the contrary practice may now have its fair returning period, and of equal or longer date. All these changes take place however without any very essential departure, or ought at least, from the general principles universally admitted.

Of the Lever, Purchase-bit, or Curb-bit.

The next kind of bit in use for the horse is the curb-bit, which, as it is of much greater complication of parts than the snaffle, so it appears to have been of comparatively recent date.

In ancient sculptured equestrian figures, however, something like the branches are seen proceeding from their bits, as we may see in the ancient head, pl. 2, fig. 3; but it is pretty evident, that it is proceeding from the axis of the mouth-piece, and is probably attached by a ring to its upchal, and therefore possesses no more power scarcely than the chain or armed rein would have to which it is attached; and here as it is the warrior's horse, the rein is defended by scales or plates of iron, or of brass, to prevent its being divided by the sword. The other head, fig. 2, in all other respects alike equipped, has the rein (a short rein, or bridon, or rein of reserve) without any defence of this sort, the iron branch therefore was probably merely a continuation in solid metal of a flexible chain, or rein wanting a purchase from want of a solid connexion with the mouth-piece.

Italy appears to have had the honour of the invention of the curb, which country some centuries past, as we learn from their various works, (see History of the Horse, p. 40,) took the lead of the other nations of Europe in teaching the arts of the manege, and their pretensions were much encouraged in Henry the Eighth's and Elizabeth's reigns, but it was not till the Stuart's came that it was introduced into the English army by a proclamation made in the third year of Charles the First, since which time it has got into almost universal use for the army, the road, and the field, so that a horseman deems himself in general but imperfectly equipped without it.

Most of those writers who have treated of it in the last and in the preceding century, and who wrote probably soon after the commencement of its use, have been very profuse in their various proposals for the construction of it, and especially in rendering it more complicated, severe, and cruel; although it is probable their clumsy figures and absurd representations were never really imitated in actual practice. Yet they appear to have been much satisfied with their new invention, imagining it a sure means of reducing a horse to immediate obedience in spite of every obstacle; and true it is, it can punish with extreme severity; but is such a measure most likely to create or to overcome vice? Indeed, according to the opinion of one of the ablest writers that has ever considered this subject, and whose opinion we shall take an opportunity of quoting more fully hereafter, little or nothing has really been gained by its adoption; on the contrary, the snaffle is possessing more simplicity, power, and perfection.

Stripped of all unnecessary trappings, this instrument consists of the following essential parts: a solid mouth-piece with two side branches, or inflexible rods of iron firmly united to the former, and a chain fixed by one end and loose at the other, passing behind the chin for inclosing the

jaw. The branches ascending high above the mouth have an oblong square eye at their upper part, for suspending it to the headstall and staying it in the mouth; which part has obtained the name of *The Banquet*, or *Cheek-piece*. Two rings are provided at the lower extremity of the above branches to affix the reins to, which are passing to the hand. These are all the parts essentially necessary for constituting a curbed bit.

The machine placed in the mouth, and the chain passed round the lower jaw, the branches it will be seen become powerful levers when drawn backwards, acting by means of the chain upon the mouth-piece as a centre, pinching and squeezing whatever interposes between it and the chain, with a force equal to the length of lever afforded by these lower branches. The quantum of force it will be perceived is not only measured by the length of lever below the mouth-piece, but also by the distance at which the chain is affixed above this centre, the farther it is removed the less the power, and it is usually affixed to the eye of the cheek-piece; therefore, the horseman sometimes quaintly says, that it is the eye of the banquet that commands the bit.

It will be manifest therefore from the construction of this instrument that its whole force is exerted on the jaw itself, in squeezing it, and that it has the power to pinch the bars with cruel violence even to the fracture of the bone, which with branches of no unusual length has often happened. It can also crush and bruise the tender lining of the mouth, and the skin also beneath the jaw. If the horse fall upon the ground, and these bits receive the impression, little less than the fracture of the jaw can be expected, of which a case occurred at Knightsbridge, and was under the care of my friend, Rogers, an eminent veterinary surgeon; and another friend of mine fractured his blood horse's jaw with it, and a most tedious case it was, in the former case, a piece of the bone exfoliated as large as a filberd, which he presented to me, that we may guess a little what sort of impression these iron levers produce.

From considering its mode of operation, it might reasonably be doubted whether it does in reality stop the horse by any power or opposed force, as is generally conceived at present, or rather by the severity of the pain it inflicts; for, should the horse arm himself against this, it is totally insufficient to arrest his course; in proof of which instances occur in runaway horses every day. Indeed the snaffle has the advantage, where a powerful arm is used, and also in not maddening and rendering the animal infuriate and desperate, and this is the opinion also of many really practical and experienced horsemen.

We have considered these branches as plain straight levers of indeterminate length; in actual practice however they are varied in all manner of fantastic ways, which are often considered as of peculiar effect; by some they are bent into the figure of the letter S, and by others into that of the letter C, or Z, which they are sometimes told by the bit-makers are productive of unaccountable effects; but it is the length of the lever alone that gives it its power, so these differences, as far as they effect the animal, are not of very great moment, though the simpler the better, for many good reasons. And some there are who turn the ends of the branches outward, pretending that this makes them very powerful indeed, and one thing it certainly accomplishes, that of adding more awkwardness to an instrument already very uncouth. In the army, formerly, they were used of an enormous length, but this barbarous custom has been of late

most wisely done away. Stopping horses at full gallop too suddenly, and without sufficient warning given, has been productive of miserable effects, and especially to their hocks, by causing curbs or callous enlargements at their back part, of a most injurious description.

The most useful bit of any of the curbed kind appears to be what is called the *Weymouth-bit*, at present in common use for draft horses of light work, as for carriages, stage-coaches, &c.; which consists of a strong, plain, polished mouth-piece, of uniform thickness throughout, without any upset whatever, but only a little curved forwards, to give more liberty to the tongue. This construction is not only the simplest, but as we have already stated, the most useful of any of this order of biting. The arch however should be kept flat, for fear of painfully compressing and squeezing the bars together.

Of the Mouth-piece. This part in the curb-bit is usually provided with what is called an upset or arch in the middle of it, as it would, if perfectly straight, rest on the tongue, and occasion unpleasant restraint, for we see in the frontispiece how high the tongue is above the other parts. This passage for the tongue is often made so narrow and small by the bit-makers, that one should apprehend they scarcely had a right idea of its use or intention. From the circumstance of its allowing a passage for the tongue, it has been called by some the *liberty*, and, for the same reason, by others the *porte* or *door*: hence we have the *porte-mouth* bit, vulgarly called among the bit-makers and grooms the *Portsmouth* bit; and, by a supposed counter or collateral expression to this term, we probably get the *Weymouth* bit. Instead however of this part being a liberty, or advantage at least, it in reality appears to have the effect of preventing the tongue from raising the bit from the bars, and thus of not permitting even a momentary relief from its rigid impression. His only resource then, is to draw in the tender inside lining of the cheek, in order to protect the bars; and this tender part by being crushed and bruised under the iron, at length grows white and cartilaginous, as we see it represented in plate 1, fig. 1.

In draft horses, especially for the coach, it is a frequent custom to have affixed to the upper part of this upset small chains or polished drops of iron, which, hanging loose in the mouth, and falling on the tongue, occasion the horse to champ the bits, sometimes creating a copious flow of saliva, so as to slaver the lips with its white froth; and, when this happens, it is considered by some a good sign of health and gaiety, and that the horse is well bited; for, if the bits are disagreeable to him, he never plays with them, or exhibits any froth, say they. That these players tickle, and produce a flow of saliva, or slavering and froth, there is little doubt, but as to its creating any pleasure may be much doubted, since, when he is bited with easy, smooth and mild bits, consequently the most pleasant, he rarely exhibits any signs of this sort, and, on the other hand, with horses most painfully and shamefully bited we see this froth in abundance, sometimes mixed with blood. What the horse's real feelings are it is not easy to know; these small appendages are termed by the French *les chainettes*, and by the English, *players*.* Whether this irritation is agreeable or not may be fairly questioned; one purpose they certainly serve, which is well understood by the bit-makers, but we believe the more simple the bit the better, and the

* And these from being straight, or like fingers, were called by the Greeks *δακτυλίοι*, *daetylíoi*, such are often seen appended to the arch of our modern curbed bits; but whether of any real use is very doubtful; also *οβόλοι*, when round and flattened like a Roman penny or obolus; and *τριβόλοι*, if square.

more agreeable to the horse; it is also cheaper, and certainly more easily kept clean and free from rust.

It is farther to be observed, respecting the mouth piece of the curb, that the straight part which rests upon the bars of the jaw is termed by the French *le canon*, and by the old English writers the *jeive*; and, though it be a highly convenient and useful word, it is to be regretted that at this present day it is entirely out of use, the French term, which is not so expressive, or applicable to it, having superseded it. This part should be well polished, and may be made of any proper figure, as that of a cylinder, cone, oval, globular, pear-shaped, &c., the plain conical or cylindrical is perhaps the simplest and the best.*

It is obvious that the effect of the jeive, as far as it respects the bars of the mouth, will be correspondent to the thickness or thinness, smoothness or roughness, of this part; and the larger and broader it is in reason, the more surface it covers, and the pressure, by being distributed over more points, becomes less severely felt. This enlargement, however, of the canon or jeive should not be carried to excess, by making it too heavy, and a burthen to the jaws, or so large as that by filling the horse's mouth with a greater bulk of iron than it can conveniently receive, it may create pain instead of greater ease.

To render these irons less irritating to the mouth, and to avoid their friction upon the bars, the jeives are often provided with loose, moveable rollers of well polished iron, which readily turning on the axis of the bit, very considerably diminish their severity. These revolving pieces are also apprehended useful in preventing the horse from catching and holding the bit in his teeth; as the curb, under these circumstances, can still move and act with the same freedom as before;†

These jeives have also sometimes been composed of three or four flattish knobs, united by a joint to each other, and with a joint also to the upset, all which labour is intended to render it very severe; it is obvious, however, that such alteration must bring it nearer to the condition of the snaffle; if these knobs however could be drawn transversely across the bars, they might produce considerable irritation, but not so much as they would do if not jointed. This incongruous bit is not unfrequently used, and is called with us the *Hessian-bit*. Its greater flexibility and consequent mildness is the true cause no doubt of its being more approved.

This curb-bit is often made with a ring or loop opposite to the mouth-piece, which, as it is directly in a line with the axis of the bit, can have no other effect, when the reins are affixed to it, than a snaffle would have, if provided with a similar mouth-piece. This is termed putting "the reins to the cheek," and for horses of light draft, whose mouths are not ruined, it is by much the best, as the mouth is less annoyed, and the horse obeys with

* Jeive was, I suspect, the old English or Saxon name for the snaffle before the Norman invasion; and hence Gibes and Jeers, for a twisting up of the corners of the mouth in jest or derision.

† We however much suspect the notion to be a fallacy altogether, for in the fore-teeth he cannot get it, as the head-stall prevents its ever reaching them, and hard iron is of a nature so unpleasant to bite upon, that I suspect no horse will touch it in this way, and if between the grinders it would throw the mouth very wide open, which I never saw or has any one of my acquaintance. The horse indeed could not well be bited if he had it in his power at pleasure to take the bits in this manner in his teeth, so that I suspect the whole is a groundless imagination and fable, like many others in this art; when the horse perfectly resists the bits, I rather incline to suspect, he throws up his head and lets them fall against the fronts of his grinders.

more alacrity the guidance of the hand from this point, than from the extremity of the branches, which are particularly ill calculated for such a purpose.

In the older English writers, as well as in those of the Continent, on the subject of bits, we find an appendage described, which is not at present at all in use; and, as it enters the mouth with the mouth-piece, it may with propriety be described along with it. It consisted of a chain extending from branch to branch of the banquet, or cheek-piece, being placed rather above the mouth-piece, and parallel to it, and was stretched across perfectly straight and tight. This part was called the *water-chain*, and by the French *Trenche-file*: its use is not very evident. Mr. Berenger takes notice of it, and observes "that it might be useful to horses that are apt to *drink* or *swallow* the bits, as the expression is, or bury it so deep in their mouths, as to hinder it from having a due and just effect:" from its being laid aside so universally, we presume it has at least been thought useless.

It is also a common belief with the grooms that a great power resides in the upset of the mouth-piece, and that the bits are more powerful as this is longer or shorter; nothing, however, can be more ridiculous than this reasoning. In the works of Laurence Ruse, a French writer, we find, therefore, in accordance with this idea, a curb with an upset of most unusual length, being destined to correct the vices, "*d'un Roussin qui à la bouche d'une diable*;" it will be obvious, however, on a moment's reflection, that this part, from being made very lofty, and coming forcibly against the palate, would compel the horse to open his mouth, when it would cease farther to act in any way; with more reason, the same writer proposes, on the other hand, "*pour donner grand plaisir*," to have a bit constructed with a low and sufficiently wide upset, with large, conical, smooth rollers for the bars.

Of the Chain. The chain is the part most essentially necessary to give effect to the branches of this kind of bit, and it may be placed or fixed, as we have already noticed, at any given distance above the mouth-piece; its operation being more powerful, as this distance is exceeded by the length of the branches. This position, though true as a general principle of reasoning, appears to be subject to the operation of other causes in actual practice, which it will be necessary just to consider; for, in direct contradiction to this is the assertion of Berenger, who appears to be almost the only writer who has really at all investigated the merits of this particular object. He observes, in regard to it, that the nearer the chain, and the longer the branches, the softer and more indulgent its operation. This, on a first view, appears to be in direct variance with the rules above laid down, and irreconcilable to the well known laws of the operation of the lever, and even at variance with his own preceding assertions: when, however, we remember the experience and practical knowledge of him who asserts it, it deserves a more particular consideration. Let us first admit the truth of the position, as it seems founded on the sure test of actual experience, and then we should venture the following as the most natural explanation of it.

In proportion as the branches are longer, the more extensive is the circuit their extremities will perform in their operation; and therefore the hand that guides them must pass through a greater arc or space to produce the same effect: and now, if the chain be placed very near to,

the axis of the mouth-piece, and be applied not very tight about the chin, yet, in reality, though there would be an apparent increase of power by the length of the branches, they would have little or no effect, as the hand would arrive at the utmost extent to which it could be drawn before the chain would begin to pinch. But it is clear that a shorter lever, with a chain fixed not so close to the centre of motion of the bit, would produce a quicker effect with less motion of the hand. So that perhaps this paradoxical proposition about long branches will be best avoided altogether, from the great uncertainty of its conditions being exactly complied with; and then it would become, instead of a tender and indulgent bit, the very severest of any.

The chain being fastened on one side to the eye of the banquet, or cheek-piece, where the headstal is fastened, is fixed on the other to a hook or crotchet hanging from the same part. The chain, as it is at present used, is composed of iron links or rings, so bent or indented as to form, when put together, one uniform nearly smooth flat surface; and by twisting or untwisting these links, it may be made to present a surface with any degree of roughness to the chin.

Where great tenderness is required, this chain may be covered with leather or cloth; or, where a still greater delicacy is desirable, the curb may be made wholly of leather, without any chain. The larger and thicker the rings are, provided they are smooth and well polished, the easier the effect of the chain. It should be also longer than necessary, in order to its being applied loosely.

In old English, this chain was used to be called the *kirble*, and hence, by contraction, *kirb*; and by the change of the *ki* into *cu*, we apprehend the modern appellation of this instrument has been obtained.

In concluding, it remains for us to notice the proper application and adjustment of these bits to the horse's mouth, and afterwards to treat of their manifold abuses.

By the management of the headstal, by its straps and buckles, the snaffle bits should be so adjusted as to fall in the middle space between the tushes and grinders, resting upon the bars: the mouth-piece of the curb should also occupy the same situation; when however it is used along with the snaffle, the bits of the snaffle should be placed first, and highest in the mouth. If the bits are placed too high in the mouth, the horse will carry his head awkwardly aloft; and if too low, he will stoop the head, and perhaps try to play with them in his teeth, or perhaps thrust them from his mouth altogether.

The thicker and more fleshy, and the wider or broader the bars of the horse are, the rougher may be the mouth-piece, and the leaner and more delicate consequently, the bits should be less severe, which is not enough attended to, and is a source of great suffering to these animals. Care should also be taken that the mouth-piece be well suited, to the full width of the mouth, and that it be not too narrow, as this would give pain, by squeezing the bars together. Where the tongue is large and also prominent, the upset should be in proportion, otherwise the bits could not rest upon the bars, but would press alone upon the tongue.

In regard to biting the horse, and the consideration of its real effects, we cannot desire to see anything more consonant to truth and reason than what has been given us by Richard Berenger,

and with some useful extracts from his valuable performance, we shall conclude this part of our subject.

Of the Education of the Young Horse to the use of the Bits.

Of Biting Horses with the Curb. "In the beginning of an undertaking, whose aim is to subdue and reclaim nature, and that at a time when she is wild, ignorant, and even astonished at the attempts which are made upon her, it is evident that she must not be treated but with lenity, instructed with patience, and by small degrees, and that nothing should be offered that may hurt, surprise, or occasion any disgust.

"The horseman, therefore, should not act the part of a tyrant, but of a lover; not endeavour to force her to submission, but strive to gain her consent and goodwill by assiduity, perseverance, and the gentlest attentions: for what prospect of success would rougher manners afford? To what purpose would it be to compel a colt to go forward, or turn from fear of the whip or spur, and to trot and gallop so freely as to supple his limbs, and form his paces; if the novelty of the bit, and the unaccustomed restraint to which it subjects him, should vex and confound him, so as to make him not know what to do, or how to behave in these extremes? It cannot be expected, that he will be guided, and go with ease to himself, or pleasure to the rider, if the instrument, by which he is to be conducted, offends or gives him pain: all habits and acquirements should be attained gradually, and almost imperceptibly: rigour and precipitation would ruin all; and, instead of forming the horse to the execution of what is required, may plunge him into vice and rebellion so as to occasion much trouble and loss of time before he can be reduced."

"He should not, therefore, at first be considered as if he was designed to be formed to all the delicacy and exactness of the bit; and the horseman should be content, if he will endure it in his mouth, so as to grow, by little and little, accustomed to it, till the restraint becomes by habit so familiar and easy, that he not only is not offended, but begins even to delight in it; for this purpose, great care should be taken that the bit be easy and gentle in all its parts; that the mouth-piece be larger than it need be for a horse already used to a bit; and that it in nowise incommodes the bars, squeezes the lips, or galls the tongue.

"The mouth-piece, called a cannon, with a joint in the middle, will be the most suitable; the ends of it should be as large and full as the size of the mouth will permit, for the thicker and more blunted they are, the easier they will be for the horse, and the *appui* less strict and severe.

"The links of the curb should be big, smooth, and well polished; the curb somewhat long. The branches should be exactly even with the line of the banquet, to make the *appui* moderate and equal; they should likewise be long; nor does it signify of what shape they are, for with most horses they ought to be so weak as scarcely to have any effect; so requisite it is to guard against everything that may annoy or disturb the horse in these first trials. In order to recon-

* And so says Xenophon, "that when you would wish to slacken the pace of an eager horse, that hurries on too fast, and would pacify his fury, and make him go more temperately, or even oblige him to stop, you should not attempt to do it at once and with violence, but artfully and by degrees, gently pulling him in, then yielding the bridle, and playing with his mouth, in such a manner as though you wished rather to win his consent than to force his obedience."

cile him to this new constraint, the reins should be held in both hands; and the horse, for some time, should only walk under the rider. Above all, upon this and all other occasions, a firm, a light, and diligent hand, is necessary.

“Such are the outlines and general principles upon which the art of biting horses is established; which art, as far as it reaches, is sure and constant; but which, in spite of all the merits and praise of which it has so long been in possession, will, upon a serious and strict trial, never, I doubt, be found adequate to the views of a sound and intelligent horseman, nor capable of bringing a horse to that degree of suppleness and exactness of carriage, which the truth and perfection of the art require, these attainments seem to have been reserved for a more simple but powerful machine, called the *snaffle*.

“To perform his business justly and gracefully, the animal must first be made supple in his fore parts, and his head and neck so managed, that one may be raised, and the other arched or bent more or less to the hand to which he is to turn. The bridle called the bit, is so impotent in its endeavours to raise the head, that it even produces the opposite effect; nor from the confinement in which it keeps the horse, and the small compass it affords for the action of the rein, does it allow the rider sufficient room to bend him, without pulling down his head, and putting him upon his shoulders, both of which are incompatible with the true and sound principles of the art. The frequent use of cavesons and bridons fully evinces the want of power in the bit to supple the horse, or raise the fore part.

“The figures and representations of horses working upon different lessons, may be appealed to for the confirmation of this assertion. The books of past times abound with them, especially that boasted work of that king of horsemen, the duke of Newcastle, whose horses are all drawn with their heads between their knees; and yet are exhibited to the equestrian world as standards of truth, and models of perfection. The successors of this duke, and of other great masters as imitators, are generally a blind and servile herd, who ran headlong into the errors, and adopted the faults of their predecessors; and always made use of bits, without reflecting upon their effects, or perceiving that they could operate to make the horse carry low, or to put him upon his shoulders, while they thought all the time that he was upon his haunches.

“If ever there was a panacea, or universal medicine, the *snaffle* is one, for the mouths of horses; it suits all, and accommodates itself to all; and either finds them good, or very speedily makes them so; and the mouth once made, will be always faithful to the hand, let it act with what agent it will. This bridle can at once subject the horse to great restraint, or indulge him in ease and freedom; it can place the head exactly as the horseman likes to have it, and work and bend the neck and shoulders to what degree he pleases. He can raise the head by holding up his hand; by lowering it, it can be brought down; and if he chooses to fix and confine it to a certain degree, he must use for this, as well as for the purpose of *bending*, *double reins*; that is, two on each side, the ends of which must be fastened in a staple near the pommel of the saddle, or to the girths, higher or lower, as the mouth, proportions of the horse, and his manner of going, require; and, if properly measured and adjusted, they will form and command the horse so effectually, as, in a great degree, to palliate many imperfections of the mouth, and many faults in the mould and figure of the animal.

"The reins thus fastened, or even one only, for the sake of working one jaw and one side, will operate more or less, as the branches of a bit; and the snaffle will almost be a bit, a bridle, a cavesson, and a martingal, in one. When the horseman would bend the horse, he must pull the rein on that side to which he is to go, carefully observing to lengthen that of the opposite side, that they may not counteract each other. Nothing will awaken a dull mouth, and bring it to life and feeling, so soon as this bit. If the mouth be hard and callous, the iron should be so twisted as to have a sort of edge, which will search the lips, and when these will permit, the bars also; and if gently moved, or drawn from side to side, keep the mouth fresh and cool.* If the twisted or rough snaffle be thought too harsh, and the hand not skilful enough to moderate its effects, a smooth snaffle may be used, or if a bit of linen be wrapt round the twisted snaffle, it will make it easy and smooth; and the mouth, once made fine and delicate, will be true to its feelings, will obey the snaffle, and follow the hand with as much exactness and precision as the bit knows to demand, but with more freedom and boldness than it ever can allow."

Such are the properties and merits of the snaffle, which long observation, and not a little experience, have taught the writer of this article to think preferable (generally speaking) to those of the bit; and which he has been therefore induced to point out and recommend, with due deference to others, but with a greater deference to truth and justice: "*destrahere ausus, herentem capiti multâ cum laude coronam.*"—Berenger's Hist. and Art of Horsemanship, vol. ii. p. 221, &c.

Such are the proofs of the advantages of gentle biting over severe, from one of the most experienced and reflecting horsemen that has appeared in modern times; he was indeed made equerry to King George the Third, and was the first, after Browne, (On Snaffle-riding, 1624,) to call in question the absurdities of the Italian and French schools of equitation with the curb. Browne, in order to this raising of the horse's head to the bit, in his first lessons, which are attended with some difficulty, recommends the use of a pulley, over which a cord passes to the hand of the equestrian standing behind the horse, slaking it to him and encouraging him whenever he raises his head to the impression of the bit, which is naturally enough apt to produce the contrary effect, perhaps indeed at the first, not exactly understanding what is meant by it, creating an impatience in obeying the calls of so very novel and unexpected an intruder, made often for young colts preposterously large and heavy.†

* These are words current among horsemen, but certainly very wide of the truth and of fact, or of what is even meant to be conveyed; a state of non-irritation, is perhaps all that is really intended. As to the dryness or moisture of the mouth, it is the state of the body, as well as the effect or degree of irritation which the newly inserted bit occasions to the mouth, that must be taken into the account in producing this condition of it. The language of modern horsemen hitherto abounds in ambiguity, obscurity, and even sometimes wilfully delusive expressions: neither is this chapter, the best certainly in the whole work, entirely free from contradictions and obscurities. A joint to a curb bit renders it only an incongruous anomaly of no character whatever, neither can branches without being ridiculously long and slender be "tender," that the idea or expression of tenderness is a mere delusion, and others we could also point out.

† Was I once more to engage in this department of study, I should think it worth the ascertaining how far this carrying of the head low was occasioned partially or altogether by the bits in the mouth, or whether in part it might not be influenced by the pressure of the headstall against the tender part immediately behind the ears: a part which the ancients held almost sacred,

On the Abuses of Biting.

Having been much used to, and employed among horses, during a course of forty years, in which time I have witnessed a great deal of unnecessary ill-treatment towards them, I can hardly conclude this essay without some observations and remarks which my experience has afforded me, in respect to this instrument, in order, if possible, to lessen the mass of suffering these worthy creatures are still made to endure. Their inoffensive lives, defenceless state, and often profitable and delightful labours, one would think must excite feelings of compassion towards them, and in every man they would find a friend; it is however far otherwise; and, where interests are concerned, they are often very little better considered than mere inanimate machinery, that is without sense or feeling. And it is sorrowful that custom and frequency, instead of making us more alive to the gross amount of oppression, hardens us till we see it not, or only as a matter reconciled by its notoriety. And then again abuses are often carried by extortion and ignorance together so far as to bring loss instead of profit to the extortioner. Surely, in these reforming days, we ought to hope that his claims will ere long meet a more general attention, and that in the public he will find an efficient protector, and that his days which are passed in misery and pain, might as well, under another system, be passed in cheerfulness and comfort, with its many attendant advantages.

Certainly, when this machinery of the curb hangs loose in the mouth, and the chain is dangling about the chin, no great harm can arise from it, beyond the clumsy bulk and weight of metal that his jaws, in this case, have to hold and to carry. It is a mass however irreconcilable to sense and reason, and which, if he had really required, (for it is cowardly fears and groundless apprehensions that usually lead to it,) he would have been indeed but ill suited for that domestic station he was evidently intended by his beneficent Creator to occupy in men's affairs. Though if dangling in this way, the bits are productive of no greater harm than we have stated; yet if the branches are long, and the chain tort about the chin, as we frequently see it, then it becomes indeed such an instrument as no ignorant man should be intrusted with, remembering well the strength and weight of the reins themselves, and of a heavy arm and clumsy fist dwelling upon such a machine. We will also farther observe another condition of it, which, as it is mere matter of chance whether it be present or not, must continually occur, viz. that the chain has been left of that length or looseness that the reins bring it to tightness just as the branches are at a right-angle or perpendicular to the chin or jaw; it is then in its severest attitude, and capable of executing a most

and to be kept exempt from pressure; and no one practically experienced in the use of the horse but must have perceived the very great aversion they have to this part being pressed upon or pulled at. See Stereopleon, p. 26, for further details. This circumstance is wholly disregarded by modern horsemen and bit-makers. And we would especially draw the reader's attention to the place of the frontlet in ancient representations; it is nearly half-way between the ears and the eyes, in the horses of the quadriga race of Annia Arescusa, and also in the two heads from Trajan's column, given at Plate II., fig. 2, 3; therefore clearly not the effect of accident, but design, for here the topmost strap of the headstall, we may observe, is thrown back several inches distant behind the ears, on to the *encolure*, or arch of the neck: thus avoiding any pressure directly behind the ears, which is in fact the *occipital region*, or place of pithing; the most tender and undefended part of the whole horse, where the insertion merely of a penknife blade would be instantly fatal. Nor does it appear by their writings that they were nearly so much incommoded by this holding down of the head on the first application of the bits, as we seem to be at this day. This effect of holding down the head we are led to apprehend, arises in a great degree from an attempt of the horse to suspend the bits in his mouth, that their weight shall repose upon the headstall rather than upon his bars, as being the lesser of two evils, at least we wish to call the horseman's attention to this view of the matter.

cruel crush to the jaw and its coverings, such a one as we cannot contemplate without shuddering. It is in fact as a hair-trigger pistol in the hands of a child! We may suppose also, without any violation of the truth, that the driver is not only ignorant of the effects of his machinery, but that he is half inebriate, and full of the notion that it is all by his strength that he is to command and arrest the course of these animals, and that he has a right so to act. Yet are these the very men that, from an abuse of that power, most frequently get into trouble. If such a machine was placed about the shins of one of them, before he was suffered to mount the box, and gently twitched by one of his comrades, he would be much more likely to understand and to consider well before he hauled a good one upon the jaws of his friend below the box. How often do you see Mr. Coachee, before he starts, starting down from his box to tighten that curb-chain which his friend the horse-keeper had left mercifully relaxed, and whose prudence and long experience had had but too often to see and witness on his horse's jaws the consequences of a different conduct; caution and knowledge prompting the one, tyranny and cowardice the other.

Now the power of pinching, for that in reality is all, as we have stated, these sort of machines can do, is so severe, that the poor animal expresses his inability to bear it generally by shaking his head first, and this availing him nothing, it is often followed by direct rebellion; this is only met by severe chastisement, which I have often seen, or is perhaps defended, by the ready pretence that it is all for want of a more severe biting! and in this way is he made *to face*, to use their own expression, his tortures. Has not every animal his natural rights? can we therefore be justified in taking him from his natural haunts, and bringing him into our services, promising by caresses not to hurt or abuse him, and then inflict upon him such abominable torments; it is indeed the want of knowledge more than any design of the kind that this is to be attributed to; the public too readily, yielding to the practices of ignorant pretenders to the art. Often have we seen them with their mouths wide open from the effects of this lever bit streaming with froth and blood yet peaceably working: at other times, pinched on one side by the bit and chain, and endeavouring to avoid it by carrying the head to the opposite, but which, as this looks ill, is met by a friendly strap to prevent it.

What an abominably painful sensation these bits excite in the mouth, is most manifest from the very great uneasiness and dislike which nearly all horses exhibit on their being first introduced to them, which in some spirited horses can never be overcome, but which are perfectly gentle with a common snaffle. The continual accidents also, from their abuse, exhibit its inaptitude for common use; accidents which appear almost daily in the papers: some ascribed to the true cause but many not, from the ignorance in these matters of the reporter. The following may serve as illustrating this position, taken from the *Times* newspaper. "Accident in Smithfield: As a carman was driving his cart through Smithfield, a gig-horse *flew round* and backed against the cart, and the gentleman was thrown out," &c. Why did he fly round but because the severity of the bits made him furious with pain, and he tried to get relief in this way most naturally.

I once also was witness to a curious scene on Blackfriars Bridge, of a young man in a gig, who had gagged his horse severely with the curb, being perhaps his first performance: he pulled the bits, and the horse, perhaps not used to be so treated, backed, unable to bear it; indeed, without much pulling, the weight of the reins seemed sufficient for the effect. He then flogged the horse

and went on a few paces, and on this discipline ceasing he again backed; again he flogged, and again advanced, but on the cessation of the castigation, he again stopped and backed, evidently unable to face the bits. In this way he was continually stopping and backing, to the great amusement of the spectators upon the bridge, till I begged him to allow me to check the reins, which was no sooner done than he proceeded without further inconvenience.

Another I take from the *Times* newspaper, of rather a different description. "A few days since, as Sir P. L. and his lady were riding on horseback, her ladyship's horse suddenly reared up and fell backward, by which accident she broke her collar-bone." It was only wonderful that the animal, unable to bear the pinching of the machine, had not fallen upon her, and crushed her to death. It shows at once what must be the pain, when an animal will rather risk his life by such a *renversement* than suffer the pain of the pincher-machine. Another I observed in a different paper thus: "An inquest has been held by the coroner for Bury, when it appeared in evidence that the blow given to the horse was very trifling, but he was checked by the curb rather too sharply, which made him rear, and occasioned the fatal accident." The rider no doubt retaining the reins in his hand, and pulling the horse over him, &c.; and such examples we might multiply *ad infinitum*. It is indeed most extraordinary, when so many disasters are continually taking place, that people will persist in their use, especially ladies; but the fact is, they are deceived first, and are wholly misled as to their real nature and properties.

The following incident I was witness to not long since, and the relation of it may not be without its use. A lady, a stoutish lady, was driving a pair of black ponies in Lincoln's Inn Fields, in a handsome curricule, with the reins to the very ends of the curb-branches, and pulling pretty vigorously; the animals from pain unable to proceed, were disposed to stop and to back, but this not suiting the lady's intentions, she applied the whip pretty smartly to her two little steeds, and a curious scene ensued, for the more she flogged she tightened the reins, for fear of their running away; they turning and twisting their heads about, and not knowing what to do in such an extremity: as whenever they inclined to stop, which was almost as soon as the whip ceased, she was obliged to begin again to flog, to keep them going on; and, what with the exasperated state of the horses, and the lady's getting heated from her exercise of flogging her two ponies, first one and then the other, the scene became ludicrous enough; neither did she at all seem to apprehend the source of her troubles; and, although wishing it, yet I feared to say a word, knowing how ticklish a matter it is to interfere in horse concerns, so left them to their labours; but how it ended I know not, let us hope not tragically. Curbs are bad enough at all times, but to drive from the extremities of the branches is certainly the very height of absurdity, for any single lateral movement of the reins, it is obvious, must have the effect, if it were possible, of twisting or turning the bit round in the mouth on its perpendicular axis; an effect the most abominable and unjust that it is possible to conceive. With the snaffle the horse's head is simply directed by the adverse side cross-piece bending him or drawing him towards the side we wish him to turn to, but, as to the branches of the curb, it is obvious the reins applied at their extremities, can have no corresponding effect to this, but will pinch or wring, and, if it were possible, turn the bit round, as we have said, in his mouth.

I have observed that horses quite gentle and tractable with the snaffle, will become impatient and pulling and fretful with the curb. And I might illustrate this by a case that actually occurred,

and of which I was myself an eye-witness ; as it may serve also as a lesson on the subject of shying. A gentleman of my acquaintance had a spirited chesnut blood-mare that used to shy badly, and from fearing the severe infliction of the whip in consequence, had become almost ungovernable ; she had broken one man's leg, and the groom to whom it happened refused longer to look after her, so that her owner, a gentleman I was intimate with, was compelled to sell her, and an officer in the army bought her, nor did we at all know what her destination was to be.

Walking one day, a few months after, along Oxford street, near the Pantheon, what should present itself but this very mare, for she was a gallant looking subject, and, above all things was equipped with a lady's side-saddle upon her ; her rider had dismounted on some errand or other, and there stood by the mare a servant who held her. On well regarding her, and assuring myself, that I was not mistaken in the subject, I went up and accosted the young man who was holding her, considering it my duty to give them a fair notice of the very dangerous subject they were using ; and when I spoke of the desperate vices of the animal, the lad smiled at my fears and apprehensions, and told me the same lady who now rode her had ridden her for three months past, and had constantly used her, and no creature could carry with more gentleness and propriety ; and as to shying, she never did anything of the kind now, whatever she might have done. In short, the poor creature, no longer fearing the powerful arm of her former master, who was both passionate and strong, and the severity of his bits, had lost all her vices, which had been kept up, if not entirely produced, by such undue severity, and which entirely subsided on its removal, and even perhaps all jealousy of it, in the service of a new and gentle subject every way so totally different to the former. I had before believed in the doctrine of gentleness producing its like, but had hardly believed it possible that it could have been true when carried so far as in this case it appeared to be.

We have now to make a few remarks on the parts of the mouth subjected to the bits and on which they rest ; for, strange as it may appear, it is but too true, that whilst so many treatises have been written on biting, and so many horrid machines invented by venders of the article and others, not one of them has ever deigned to extend his observations to the parts themselves on which their machinery was intended to act : their whole doctrine and discipline seemed engrossed in apprehended correction of vices and of runaways, as though all the rest, the infinitely more numerous body, were of little or no consideration.

We give therefore, for the first time, a representation of these very parts. In Plate I., fig. 1, which is a side view of the exterior of the jaws, is exposed (the mouth being a little opened with the finger and thumb,) the situation of the incisors or front teeth, and next the lower and upper tushes, the former we see much nearer to the incisors than the latter, thus giving them more advantage in combat of rending their adversary, and affording also to man at the same time a more convenient space and greater latitude for the application of the instruments of his guidance and restraint. Neither can we much doubt that, as the animal was given by a benign Providence for the use of man, that such considerations were altogether omitted in his formation, and more especially so as we see no such provisions in other animals.

These void spaces are called THE BARS, which extend to the commencement of the grinders, whose presence is marked by a protuberant appearance of the cheeks. We may also note a

broad ridge or wrinkle of skin with a depression behind it, posterior to the corners of the mouth, which has now become permanent from the long continued and severe operation of the bits, the parts being kept continually and violently pursed up and drawn back till they assume this state even when not in use. The mouth a little opened with the finger exposes also the interior of the lips and cheeks, which from red, have become white, hardened, and cartilaginous, through the friction and pressure of the iron, and which thickness, is also of some depth, and without doubt from its rigidity unpleasant enough to the feelings of the animal.

THE TONGUE also, its upper surface is seen rising (for the subject was alive when the view was taken,) much above the jaws, or bars, and even above the extremities or points of the tushes.

The representation, fig. 2, was also made from the same head, (the animal being killed,) and whilst warm, a section was made with a saw precisely where the dark line of fig. 1 appears, and exactly through the parts where the bits usually repose, for it is not possible to obtain any good view of these parts by any other means, the bits being usually drawn or forced so high up within the inclosure of the living mouth, as to be out of sight.

We may now observe into what a relaxed and puckered state the cheeks have been brought by the biting, and also how the tender inside lining has been reduced to a dense, hardened, cartilaginous condition, for this was a coach-horse of about fifteen hands and a half high, and going to be killed on account of the farey, at about eight or nine years old; the corners of the mouth also were wrinkled, swoln, and stiff, and perhaps in degree painful, from their size and excessive rigidity. Now if I were allowed an opinion in the matter, I should say that the formation of this hard substance should be prevented by all the means in our power, instead of which so little is this thought of, and so indifferent are they to the matter, that not only is the severest use of this abominable pinching engine employed upon them, but that they often leave them for hours together gagged up with a tight bearing-rein to a degree that no power of the arm for any length of time could exact, and this when wholly unemployed, and where there was no occasion for it! crushing also, and spoiling the throat, and sometimes inducing pole-evil by the violent strain induced upon the cervical ligaments. Is this obeying the generous precept that forbids us even to muzzle the ox that is laboring for us? Must we forsooth go further, and destroy the very parts by which we are to lead, guide, and conduct them! Such is modern refinement in the use of these worthy animals. Is it possible such abuse and folly can much longer be permitted to go unnoticed.

A broad plate or lamina of loose skin from the inside of the cheek is seen extending over the right another also over the left bar, and resting upon it, being perfectly white and cartilaginous, and which has been extended and rolled out as it were by the abominable pressure of these irons of the mouth-piece or jeives. These flaps or extensions of the internal membrane, we suppose can be withdrawn from this position or be applied to it at the will of the animal. It is, however, but natural to suppose that on the first application of the bits they are not fully possessed of this power or means of defence, but learn it after a time from habit. For if the bits were resting directly on the bars themselves, their impression, there is every reason to believe, would be quite intolerable, at least to a fine thin, blood mouth. The tongue also, we may observe, is occupying a remarkably elevated situation in respect to the bars, higher than one should by *a priori* reasoning have been led to suppose, and if violently forced down by the bits upon the bones

on each side would be liable to be cut through in meeting them, and which has sometimes actually occurred; the central part of it, however, would probably recede within the space between the two jaw-bones, and thus resist disunion, hanging only by a piece, as in this accident it has been often so described. A broadish white line is also distinguishable between the two bones; which is part of the jaw itself, it becoming a solid mass, by the bars uniting, a very little anterior to the place of section.

It would appear that, in the biting of the ancients, the points of their *lupata* were applied chiefly or solely to the surface of the tongue, and were so placed as to rest upon it. There is one passage, however, in Xenophon, which would seem to favour a different doctrine, and make it doubtful if the points were not resting on the bars. The horse in this way, with them resting on the tongue, would certainly have more chance of avoiding their effects, and an extreme degree of punishment, since the tongue can more easily recede and change its condition as to hardness, and is in itself also less sensible. Some have stated that the cavensons of the ancients were provided with points inside to guide by; but this I suspect was not intended for horses, and has been rather too easily assumed without any sufficient authority.

In the view thus afforded of the interior of the mouth, we are led to notice the singular fact that whilst the outside covering of the skin from pressure and friction will become horny, or throw out horn, as in our corns and bunions, the inside lining here throws out or forms cartilage and not horn, by the same treatment. In the foot we have also a sort of correspondent production in a natural way, for we may observe that although the *keraphylla* in the inside of the hoof are horny, the more internal *podophylla* are truly of a cartilaginous nature. We know horn so formed when pressed upon, is most painful; how cartilage may be in this respect when pressed upon, we are incapable of judging.

It is also a circumstance worthy of remark, and which this figure serves to display, that the two sides of the jaw or bars are not exactly alike in size or height, one being loftier and larger than the other; this must often happen we believe, and will perhaps serve to explain various anomalies that occur in the conduct of the animal during the first use of the bits, and their irregular manner of answering to them, which Xenophon and other nice observers have so often remarked upon in their practice.

To a mouth that a thread would turn, or the slightest movement of the wrist be felt and obeyed is it either justice or fairness to employ such engines as these? and, to speak plainly, it is the dangerous state of the feet, whatever pretences may be advanced, that chiefly causes the necessity for such measures; and, as the real cause of this has been now clearly pointed out and explained, and the means of avoiding it also, it will, it is likely, ere long be removed; so that the biting of the horse, like other arts, may then enjoy its proper rules, from which we ought never to depart, by unnecessary cruelty on the one hand, or committing our safety too much on the other: these are the considerations we must learn to steer between, by avoiding extremes either way, and by knowing in what this safety should best consist.

We see that a horse lashed by an iron chain to the end of the pole of a heavy coach, and at the other end by a similar chain to the splinter bar, and lashed again by chains or straps, or both, to the other horse's head, so that he cannot relieve himself whatever may be his sufferings. Indeed

with all our advantages of superior horses, materials, and workmanship, the horses of the continent, I allude more particularly to those of Germany, appear to draw heavier weights with greater ease than our horses do.

If I might be permitted a conjecture on the cause of this, I should in the first place attribute it to our over-harnessing our horses, and from over-restraint, that the animal has hardly room to act, and his being confined too close to his work. We may also remark that the post-chaise is found to run the lightest of any of our vehicles, except the chair or gig, and that in both these vehicles the point of traction or draft is directly behind him, so as to receive the full force or impression of the great moving power, his hind legs; but how is it with most of our carts, that he is obliged to exert his force laterally, as it were, by a tug-chain, often of only a few inches length, and stuck into the side of an immense shaft, and this perhaps considerably wide of his body, and the chain so short as to be almost at right angles with it. Now, if the other principle in the post-chaise be good, this must be but a very bad one, and a great disadvantage to the horse in his contending with the load.

The waggons in Germany, which carry the heaviest weights I have ever seen, have their frame diminishing downwards, and tapering very much towards the centre, or perch; by which, I apprehend, a less direct pressure of the weight is determined towards the wheels, which by this disposition are less burdened, and are forced less towards the soil than would have been the case had the load been more directly over them. Whether this explains the principle or not, I know not, but lay it before those concerned, for their consideration, the facts being indubitable.

But to return to our biting. The bits appear to have their best effect when the head or face of the horse is carried at about an angle of about 45° to the horizon; therefore that bit which affords this angle in the most efficient way, is the best bit, as it is then resting duly upon the bars, and the horse obeys its impression; it becomes therefore, a sort of fundamental position on which perhaps others may be raised or based. For, if through pain or dislike, the nose be tossed into the air, what command have we of him? or if dropped down with his chin to his breast; or if strapt to prevent this, we then have sullenness, angry humours, or perhaps direct rebellion to contend with, all of which are better avoided. And if he arm himself in his own defence, in this attitude, or "crowd himself together, not keeping the due distance which his head, neck, and shoulders should have, he will not be able to lift his legs or put them forward, hardly even so as to see his way; he must then go in a manner equally disagreeable to the spectator, and unsafe to himself and his rider. The true art of biting therefore, consists in getting the horse collected, and accepting the offices of the bit with a due resistance, yet yielding to it; and "this must be done by patience, gentleness, and perseverance, without pain or surprise; but smoothly and gradually requiring no more at first than a gentle submission, and remembering to do nothing to alarm, disturb, or provoke him."

"When a horse can stop readily and with ease, when his head is constant and steady to the bit, and he is light and firm in the hand, and so supple as to be able to obey it in all its movements with ease and readiness, he then gives ample proof that the bit is properly adjusted and fitted to his mouth, and that he is reconciled, and even pleased with the power it exercises over him. On the contrary if he opens his mouth as if he was gagged; if he wreaths and twists his jaws

about; if he draws up his tongue above the mouthpiece, or thrusts it out of his mouth sideways; if he *retains* himself, or runs backward; if he carries his head very low, and endeavours to force the hand; if he fears the impression of the bit, and it has no *appui*; if he tosses his head up and down, or refuses to advance and go forward, interrupting his *manège* with various disorders; he then gives evident reason to suspect that the bit is not properly adapted to his mouth, and that it offends or hurts it, either inside or out.

"It is also most true, that that horse that is strong and firm in his structure, and endued with gentleness and spirit, is active, and has good legs and feet, can never want a bit whose principal effect is to raise and support his head and foreparts; because he is very able to furnish to himself all the assistance he can need; and, from the concurrence of these properties, will most probably have received from nature a proper disposition and a good mouth. That horse, likewise, whose forehead is long and elegantly turned, with a lean and small head, and whose jaws at the setting on of the head are wide and open, can never call for a bit which is particularly constructed to fix his head in a posture in which nature has placed it before. Again, that horse whose mouth is large and deep, whose bars have a proper degree of feeling, neither too hard, nor too tender; with a brisk, fine tongue; small and thin lips, with the beard well made, neither too delicate, nor yet too callous, will never require a bit particularly small, nor one calculated to awe and restrain him beyond the common degree; nor one with the liberty or upset, wherein to lodge the tongue, larger than usual; nor with a curb stricter or more severe than it should be. Happy, indeed, would horsemen be, were it easy to find horses possessed of these useful and noble qualities; but this is seldom their lot, and it is from the want of some, or sometimes of all these requisites, that the skilful horseman is called upon to remedy by art, these faults, and supply the defects of nature, when she proves perverse and unkind."

It is no more than natural to expect that those who make or vend bits should magnify the dangers of riding, or that those employed in stables should often recommend and procure the most complicated; but assuredly the worst accidents have happened when these pretended measures of precaution have been used; the truth of which will be plainly seen by the several examples we have just given, as by very many others we could adduce.

Riding will always with the inexperienced be attended with risks which are inevitable; but well assured are we that long spurs and long bits, by their unguarded or accidental operation upon the animal, have been a more fruitful source of accidents than would have taken place without them; inciting the horse to acts he would not otherwise have committed. A case of sudden fright or alarm is one of the worst that we have to contemplate or that can happen; and even then we should not doubt, from what we know and have seen, that the simple machinery of the snaffle, or the twisted snaffle, is more likely to come out of the affair without mischief than the more punishing and complicated machinery we have been describing. And shying horses, if severely punished, are ever apt to connect such punishment with the object itself, and not at all to view it as a merited correction for the shying, which makes this mode of treating the evil worse than useless, and on which we may, if permitted, have a few words of precaution to give on a future occasion.

I have been often witness to an extraordinary degree of irritation and impatience of the horse

and of his running to and fro, and pulling heedlessly along into all sorts of danger, whilst using the curb, when by merely shifting the reins to the cheek, or using a snaffle, the horse has gone quietly enough; and more than one or two of my friends and acquaintance have been so satisfied of this truth, by being made witnesses to it, that they have ever after adopted the doctrine, but who were before intending to pursue rougher measures with their horses. A terrific sight certainly is a horse tearing away with his rider, and a still worse with his driver, and such will at times ever happen perhaps; yet I am firmly of opinion that in a general way these violent and painful machines are better kept out of the way in such cases. Though we admit there may be cases occur in which their use might, with some kind of mouths, possibly be advantageously employed, but only rarely, and certainly not at all in so general a way as at present is apprehended.

The bit-maker's art in the beginning was without question a very simple art, and its charges and profits moderate; but with the Italian biting, commenced the reign of violence and terror, and of charges too, before unthought of; and which times of simplicity and mild measures we heartily could desire to see once more return, with all their concomitant advantages. At present, what with his jaws crushed with the iron levers, and what with the artifices of the smiths, in barring up his feet from expansion by iron bars called shoes, and by these and the nails reducing them in size, and to the most rigid and inflexible state: what with cutting away the soles of his feet, and the horn of those other parts that the Almighty in his goodness has given him to protect him from the hard bodies of the road; what with spurs, whips, thongs, chains, and straps, it is indeed with him an iron age, and in a literal and no metaphoric sense of the term. What animal is there that could possibly deserve such criminal barbarity, how much less then, one that is daily and hourly so essentially contributing to our pleasures and interests?

Berenger, in speaking of the branches of the curb, says that they should be "flexible and long;" now as to flexibility, I have never seen any such, they are all made of hardened steel, and much too stiff and short to have any such property, and to bend and be flexible, they must have had a length and thinness that would have made them most ungain and preposterous; it is therefore only a delusion to suppose such a thing, that the notion ought to be entirely banished, as leading us to imagine an indulgence where in fact there is none.

And here we may just observe that it will be found sometimes advantageous and pleasant to induce novel and fresh impressions upon the horse's mouth, by a change of the bits in some way or other, as a continued sameness in their impression is fatiguing, and sometimes also it loses its full effect from it. A rider will suggest various ways of doing this; as by changing only a hole or half a hole in the length of the headstall, by which the precise point of bearing of the bit upon the bars will be changed; or a variety of bits may be kept for this purpose, some larger, some less, some rougher, and others smoother, or of different figures also; without, however, doing it in a way to annoy or offend the horse. A friend of mine told me that for this purpose he sometimes let fall one of the four reins (as he rode with both bits at a time,) using only three, dropping the curb rein on one side, which he said served to amuse the horse, and to relieve and render him more attentive to the impression of the bits. It is the effect of novel impressions always for a time to engage attention, so that the changing of bits to severer gets even them into credit;

whereas novel impressions may by almost any sort of change be induced, without resorting to violence or cruelty.

In my early days at the Veterinary College I was not a little puzzled, in examining the mouth and teeth of horses, to find the tushes worn away in various singular manners, the worn surfaces always presenting an extreme polish and smoothness; looking at the time no farther than the natural wear of the teeth, I was quite at a loss to account for it, and the more so as the tushes in the upper and lower jaw were not nearly opposite, so as to have the power of coming in contact, or of wearing each other. Afterwards coming to contemplate the use and effects of the bits upon the mouth, I perceived the solution of the difficulty, from the motions which the bits have upon these teeth, urged by the tongue and lips. It became evident also that if the jaws had been so constructed as to bring these tushes into constant use, the wear would soon have removed them, and the animal would have thereby been deprived of his means of offensive warfare, for these being given only to the males, would seem to point out this as their chief office: they are however placed too far back to be of much use in this way, and may be rather considered therefore as rudiments of those parts which in other quadrupeds of the more ferocious kind, have ruthless power, viz. the true laniarii, or renders of flesh, for in real mastication it is very obvious they could have little or no effect.

Another injustice to the animal in the use of the bits, and than which there is none perhaps can evince more ignorance of good horsemanship, is the practice of continually snatching and jaggging the bits in the horse's mouth;* it is absurdly making them to perform the office of the whip, and which any considerate driver would never employ, as the bits cannot be kept too steadily and easily applied to the mouth, if we wish to keep it fresh and excitable. A good driver also will take especial care as he tightens one rein for any purpose to one side, to slacken as much the other, a circumstance not generally adverted to, and which it must be obvious, if omitted, the mouth will be cramped and galled by a double restraint.

It may not be useless to notice another common offence against the rules of good horsemanship, that of giving the horse a cut with the whip at starting off; instead of accustoming him to the chirp, or to the slackening of the rein to him, or speaking to him in some way: which cut, continually practised, has a bad effect, since, if he be a spirited horse, it will occasion him to start off before he is desired, in order to avoid the expected stripe. It destroys also that innate pride of the animal, that at the first scorns to receive the lash; and of many a generous steed makes in the end, from such abuse, a careless slug. These things seen in print will be on their way to a reformation, it is to be hoped, which otherwise it would take a longer time to do, if at all.

It is also asserted, and we believe with truth, that there are men employed about horses so extremely ignorant of the nature of bits, and especially of the curb, as to imagine it designed for holding the horse up by, not by the squeeze and punishment it can inflict, but by its main force and mechanical purchase upon the jaw! I myself have heard coachmen maintain that they were a great support to a horse, as though a horse might legally be sustained by his jaws instead of

* A humorous friend of mine calls these tugging operators, dentists; on requiring of him the reason of this appellation, he replied that they always appeared to him to be jerking out the horse's teeth.

his feet; to such a pitch of indifference do they get about this tender part. Indeed, men are often very suddenly thrown into situations and offices about the horse, that they are quite incapable of properly fulfilling, and do such things with them as would make one shudder, and which plainly indicates the pressing necessity there is for the institution of horse-schools in every city and large town, for due instruction in the use of the horse; and without a certificate of qualification, they should not receive employ, or the full reward of their labour from the public. It is indeed astonishing and admirable often to see the patience of this noble high-minded and generous creature, under inflictions from ignorance of the most abominable kind, and of his immediately forgiving such gross injuries.

We daily see horses with only one bit in their mouths performing every duty, and so well, that of its competence there can be no reasonable doubt; our only wish is to see it become universal, and upon an acknowledged principle, and not by chance, as at the present; and such, there is no doubt, will in time be the case. We also sometimes see, from time to time, cart-horses coming from the country with their loads, and without any bits whatever in their mouths: working in cavesons or headstalls only, with a musrole; and they appear to do their work to the full as steadily as horses with two or three bits. I have been led to suppose, when this was done by the farmers, that it was from their experiencing the injuries done to their horses' mouths by the abuse of the bits, and especially by the bearing reins, grossly abused as they often are, galling and ulcerating their mouths, applied with the utmost ferocity from mere whim or fancy, or a tyrannical disposition; or from egregiously supposing a semicircle was the proper figure for a horse's neck. For the last twenty or thirty years, I have observed the biting to be getting gradually more and more severe; and have thought also whether it might not have been occasioned by our exposure of the state of their feet from the effects of shoeing;* and from their being now made fully aware of the danger, and that it was real which had always before been made light of, and was often imputed and treated solely as being the want of jockeyship in the rider or driver. Some there are also who talk of holding a horse "*tight in hand*" with these bits, with great glee; and where this is done by one who knows nothing of the effects of one bit from another, what must be the miserable consequence? though it will not be so difficult to imagine, how the patience of the poor animal must be brought to trial on such occasions! A flesh-hook through the nose would guide a horse without doubt, and he would also there is no doubt be obedient to it, but would it be fair or decent to resort to such measures; yet we really in these pinching machines do worse, as to the actual pain they inflict, though not in appearance so brutal. We saw the other day a heavily loaded errand-cart, and in it a poor feeble skeleton of a horse, and with his face duly gibbeted and "fringed" with long iron rods and chains applied to his jaws, and, forsooth, affixed to a tense bearing-rein! There could not in this case, one should apprehend, have been very much hazard of his running away at any rate, for he was greatly overloaded, and his poor ears flapping about his head at every step he took, the surest indication of extreme fatigue and weakness; and what was most curious, to crown the whole, the carter's wife had in the generosity of her heart supplied white linen covers and white tassels to his ears, lest perchance the

* See Podopthora; or the ruinous Effects of the Principle of the Common Shoe.—Renshaw, 356, Strand.

flies should in any manner incommode or be troublesome to him. Such are the tender mercies of the cruel.

The French also are not much better masters to their horses than the English, if we may judge from the common draft service in the Parisian capital, as also by their short stages, cabriolets, and fiacres. They have however, I think, some little advantage over us in using three horses to their omnibuses, and also in their stages to the coast and the interior, which, being often under government direction, prevent thereby a large portion of very gross abuse. Their cabriolet-horses, however, in regard to the use of the bearing-rein, are the most severely bit^{ed} of any horses I ever saw, and the worst shod, at least at the time of my visit there in 1828, and their heavy draft service by waggons is most grossly bad, as well by the enormously cumbrous machines they employ, as also by the immense size and weight of their huge collars, some exceeding, as they admitted to me, sixty pounds in weight, making of itself a load for the animal's fore parts, without any addition, and which soon become a very hot-bed for dandrif, filth, vermin, and mange-scabs, and forsooth decorated in all due formality outside with heavy, painted wooden boards for hames. This public mention of it, although at a distance, let us hope may be operating so as in time to bring about some degree of relief from so extraordinary and unnecessary an infliction.

We may often notice also that the coachman driving by his reins to the ends of the branches finds them so truly awkward for guiding the animal, that he is obliged to resort, whenever he wants to make a sudden turn, to giving the horse a cut with the whip, that is, the horse on the side to which he wants to go; so that, instead of both being employed in making the turn, one has to drag the other. Nothing of this sort would be at all necessary if proper bits were employed. The horse, at first, hardly understands this description of discipline, but by practice, as in almost all other cases, in time he gets used to it, such is his amazing patience and docility. I really believe no modern coachman could drive a Roman quadriga, where four horses were placed abreast, with such machinery as this, as the one horse in this case would have to bear away three instead of one.

If this bit which was the invention of Italy, (a nation perhaps the most debased in the world as to the treatment of their animals, I allude more particularly to the Neapolitan states), had been called the jaw-wrench, the scrape-palate, or the jaw-crush, or some such title designating its real quality and effects, its true nature would have long since been seen, and its general use rejected much earlier, and but for fine names, which are often great delusions, it would at least have been at any rate more warily entered upon; for most certain it is, that at least ninety-nine times in a hundred it is perfectly unnecessary. Should we be justified, I would ask, in placing a gallows before every man's door, because there might be some rogues in society? or why should we call this *the bit*, as though exclusively entitled to that name, as Brenger has done, although certainly an abuse of the word, and especially so when he himself condemns it.

It is also a surprising fact how some horses of high spirit will sometimes resist these terrible levers, running about with them often most wildly hither and thither uncontrolled, and into all sorts of danger, disregarding the rider's safety and their own, as though indignant at such unjustifiable treatment, and as if they were determined, in spite of all suffering, not to obey them;

the fact we have often seen; and it may perhaps be difficult to explain it, unless it be that their extreme aversion calls up an unusual degree of courage to disregard and disobey them. On resorting to the cheek-loop, or the applying of the snaffle, all this violence has immediately disappeared. It should be also seen that, in stage-coaches, as he is chained to the pole one way, to the traces and splinter-bar another; and again, his head is tied and strapped to the head of the other horse; so must he of necessity endure whatever they choose to inflict upon him, however painful, inconsistent, or absurd. Mute in his griefs, he bears his wrongs nobly in silence, and should therefore in every man find a tongue and a protector; had he been permitted to cry out, like some other of our animals, how would our streets have been filled with his wailings!

One could wish also to see this art, which is ever changing alternately from good to bad, and from bad to worse, or better, as it may chance to be, under the capricious systems of interest and fashion, fixed immovably on some general acknowledged solid principles of sense and reason.

In conclusion, for our part, we do not see why a simple chain of three or five links should not constitute a very good bit for a horse for nearly all purposes; the two end links might be made solid towards their extremity, and be perforated for carrying the cross-pieces, made either of boxwood, steel, or iron, or which would be more simple and answer equally well, two handsome, large, well-finished rings of brass or steel. And if ornament and show should be desired, this kind of bit would be found very susceptible of it. It is only necessary to flatten these rings and make perforations for receiving ornaments of silver, gold, ivory, or rosettes of worsted, or silk; also a radius proceeding to the centre from the periphery, or a semi-circular arch united to it by its two extremities, would carry very conveniently these objects, or any round, square, or other figured knobs or devices of any kind;—or these radii in any number might be made to project beyond the periphery of the ring, and be formed into arrow-heads, crosses, or other fanciful devices, affording abundant scope, where desirable, for the ingenuity of the artist and for his recompence. It would also be one of the most lasting and strongest bits that could be devised, much exceeding in this respect the common snaffle, which is vastly liable, even if great care be taken, to get injured, rusting, and spoiling at the hinge, the slender pin passing through a hollow pipe, making it next to impossible to get at or cleanse it, and becoming foul, soon decays.

The middle link, for we think it best to have an uneven number, we propose to fill in, or make of a solid flat piece of iron of a proper thickness, and to be perforated, if severity be thought necessary, with one, two, or more holes, for receiving spikes, or points, to be riveted or screwed into it, and removable at pleasure; these points to be about a quarter or three-eighths of an inch long, obtuse or sharp, as they should be found best to answer the individual subject they are intended for.

The great simplicity, strength, cheapness, and durability of this bit, which is almost endless, the ease with which it is cleaned and kept in order, are surely sufficient claims for its general adoption. It may have its enemies however on these very accounts. Also, it cannot very well be abused or misunderstood as those complex bits continually are. It is also much lighter for the animal than the unwieldy, clumsy, unsightly machinery we constantly see in use. I propose to distinguish this bit by the name of the *Chain bit*.

There are already a few years since the former edition of this work was published, and since

which a considerable number of these bits have been manufactured, and trial made of them, and our expectations have been in no respect disappointed. In no one instance of a great many have they been rejected, or even complained of, but have given, on the contrary, much delight. A representation of this bit in its simplest state, on one side, and with the semi-circular arc on the other, is seen in plate 2, fig. 9.

It has been tried in various hands, and by men of skill and science in the use of the horse, and also by professed masters of the arts of the manège, from one of whom, my worthy friend, Robert Dawson, of Gray's-inn-lane, riding-master at the late light-horse volunteers, and teacher of riding, I have received many valuable communications upon it, and which have been of so enlightened and scientific a nature, that I cannot forbear the insertion of a portion of them here, as they were made with more practical knowledge and experience than I can presume to.

He states in one of these communications, "that he has tried the chain-bit with the most agreeable results, and that it produced a satisfactory carriage of the horses' head, and that it controlled the movements of the horse himself without annoyance, and more agreeably than the other bits appeared to do." The experiment he afterwards made before several of his friends and others, by an actual trial on five or six different horses in succession; one of these trials indeed I was myself witness to, with several of my acquaintance. He first used the curb, next the snaffle, and then the chain-bit. The first subject of experiment, a mare evidently carried her head from the neck in a forced and constrained attitude with the curb, tossing her head and throwing up her nose, and occasionally the reverse of this, apparently for relief, by pushing her nose down towards her chest; twisting her jaws about from side to side, evidently endeavouring to prevent the bit from having its full effect upon her bars. The snaffle was a twisted one, and rather sharp, with which she carried herself better in all respects, but by no means so pleasantly and agreeably as she did afterwards with the chain-bit, with which there was the expression of a satisfied and cheerful acquiescence; and this was proved, not by the riding-master himself, but by several of the gentlemen present mounting her, and also three other horses in succession after her, in order to confirm these appearances on several subjects. It was also remarked by the master, that the chain on the lateral action of the reins, by the alternate position of the links, had the property of searching the bars and removing the lips; and that the links being large and very smooth, did not produce any inconvenient annoyance; whereas, jeives, or cannons, carried the lips in with them over the bars, nor brought them back on a lateral movement of the bit; so that, without being too severe, it appeared to operate with more effect than those bits, a circumstance hardly intended or looked for, in its formation. Nor did there appear any danger of the large cheek-ring, or upochal, being drawn through the mouth. The point also of traction of the reins upon the upochal was found to shift in the moment of draft, occasioning a less sudden, and therefore more agreeable and moderated impression upon the mouth, which appeared an evident advantage by his manner of responding to it. In this chain-bit the upochal, which is large, executes four different offices; it carries the mouth-piece; it suspends the bits in the mouth by means of the headstall; it carries the reins going to the hand; and it serves well the purpose of a cross-piece; and finally, a fifth purpose, if it be desired, that of affording a place for the hook-rein, though its easy and tempting liability to abuse makes it generally worse than useless;

benumbing the parts by its incessant pressure, and extinguishing entirely the appui, that agreeable yielding with resistance of the jaw to the hand, that is almost partaking in the delicacy of an intellectual operation, and is as the rudder in navigation, to which the ancients were fond of comparing it; it gives to riding all its zest and pleasure, and often its safety also; but which once destroyed, is with great difficulty, perhaps never, completely restored again.

The above bit has however been used to our certain knowledge, not only with the saddle-horse, but in double and single harness, with the most satisfactory results, and without the cumber of that superfluous addition, the hook-rein. Another advantage also pointed out to us was, that the flexibility of this kind of bit permitted it fully to embrace the jaw on both sides, nearly alike, whether that was made by nature even or uneven, more so than any straight inflexible jeive would have done. He farther informed me, that in a very noble horse that he had under his care for education, of a higher stature than the middle size of horses, and which he could hardly ever get to the trot, breaking nearly always from the walk into the canter, or gallop, and continually carrying his nose aloft in the air; that this horse fell without difficulty into a most excellent trot on the applying this bit to him, and without his head being at all carried up to avert the effects of it upon the mouth.

On my first suggesting this bit, I should have been very well satisfied had it answered every purpose as well as the other bits in common use, as it would then have had the advantage of greater simplicity, mildness, and more extended duration; but on actual trial, we found it to possess other properties we had not looked for, and which rendered it the more desirable. As to the use of points to the *tongue-plate*, for making a severer impression, so well has it acted in nearly one hundred instances without them, that we have not hitherto had occasion to employ them in any case, and believe they will rarely be necessary. It must be acknowledged, however, that such is the vile hardening and deadening operation of the curb or lever bit, upon the mouth, that after its long use upon these parts, and the formation of cartilage if considerable, that such horses will pull and be very uncomfortable, in many cases, on finding that a milder bit is applied to them; but by degrees, and with temperate management, will at last, most of them, become obedient to it; but some there are possibly, that no time can cure in this respect.

My friend, R. D., in a subsequent communication, says—"The third experiment I made was with a horse that with the lever bit used to go very short in his action, and carried his head very much to his chest, evidently from impatience of its effects, often tossing his head into the air, and throwing back the froth of his mouth over me; he also was difficult to be stopped in the gallop. With using the chain-bit, he would lengthen his pace, and carry his head in its proper place, and be stopped in full gallop by two or three draws of the rein." "This bit also never appears to produce any greater flow of froth, or of saliva, than what is proper and convenient;" and he further says—"It is from a full conviction of the many advantages attending this new and simple mode of biting, that I am induced to come forward and give my testimony to its effects, and the probable consequences that will arise from the general adoption of so desirable a mode of biting, which may in future remove a large amount of suffering and of cruelty inflicted upon the horse."

As I cannot, if I would, afford to be diffuse, on account of the expence of printing, and the

little hope at present of a sale for my labours, so I quit rather suddenly this present object of the bit, in order in a brief way to advert to a circumstance of no minor importance, in respect to this art, and which appears to have lain dormant and unattended to for the long period of a thousand, if not fifteen hundred years, but which appears to have been pretty well understood, though not written upon, during the more enlightened eras of the Greek and Roman empires, and which respects not the iron part of the bit that enters into the mouth in biting, but the very opposite extremity of the apparatus, viz. that which rests upon the pole, or behind the ears; a part of the horse scarcely less sensible, and in some cases indeed much more so, as it would appear, than the jaws themselves, and which I now very much wish to draw the public attention to.

To found one note upon another is a thing hardly admissible in writing, or to fix the text to a preceding note, is hardly less so; but of such sterling importance appears this matter, that we seem compelled, as it were, by its being the lesser evil, to adopt the latter course, rather than prolong a note, already very long, we allude to the note at page 35, and to which we must again refer the reader's particular attention. On exhibiting my suspicions respecting occipital pressure, contained in that note, to my friend Dawson, to whose kind services I have before had occasion to allude—he, on perusing and considering it, informed me, that he possessed a horse that uniformly resisted and carried himself badly with the curb bit, and which he had always attributed to its severity; that he however now began to doubt, from the above remarks, whether it might not be more likely to be occasioned by the forcible pressure upon the occipital, or atlantal region rather, and farther that the matter admitted of proof, by the animal being put to the test of the actual experiment. He had also a mare, that had always shewn a most inveterate dislike to the curb, on which also an experiment was proposed to be made. The suggestion was readily assented to, and the next morning, in the Light-Horse Volunteers' riding-house, in Gray's-inn lane, we met for this purpose.

The horse being first led out into the school, was mounted by my friend; a snaffle and curb bit being put into his mouth, I requested him first to make use of the snaffle only, that I might see with more exactness what took place when these two instruments were both employed in the mouth together, and was rather surprised on looking into the mouth, to observe, that when the snaffle was pulled, instead of its acting by itself upon the bars, as we had always supposed, independently and beyond the curb, that instead of this, he had, by the power of his tongue apparently, brought it forward in the mouth anterior to the upset of the curb, and on the snaffle-rein being pulled at, its whole impression was seen to be exerted upon the upset of the curb, the tongue having risen behind it at such a considerable angle, as that the upset was lying against its upper surface, the tongue not at all received into its cavity, as was supposed, and that this took place with the tongue held at such an elevation as that the bars were positively not reached by either snaffle or curb; but the tongue, hardened and raised, no doubt by its muscles, was carrying the whole apparatus on its surface, contrary to all our previous notions. And although we endeavoured, by pulling the rein somewhat rudely, we could not dislodge the snaffle-bit from this position; so that the upset was in reality protecting the tongue, and both together the bars also, which remained untouched, and so defended the horse carried his

head very properly at an angle of about 45° round the riding-house. So that it is all a farce, as I had long suspected, that this upset really receives the tongue within it, it being more than twice or thrice too large for such an admission.

We then loosed the snaffle-rein entirely, letting it fall upon the neck, so as to have no effect whatever, and took up the curb-rein. He now, in going round the school, began to raise his nose in the air, which he continued to do for some time; but after awhile took to the other mode of defence, that of thrusting his nose downwards towards his chest, and this he persisted in. We then proposed to make the experiment of releasing the headstal from all pressure upon the occipital, or atlantal region rather, it being opposite the atlas bone, by pulling with the hand the occipital strap, and frontlet also with it, back over his ears, on to the encolure, or arch of the neck, leaving the bits, in other respects, in the mouth as they were before. He soon found his release from suffering, by the removal from pressure of the occipital strap, and carried his head so as fairly to accept or take the proper operation of the bits upon the bars, and even of the curb, which was not a very severe one; thereby exhibiting most convincingly, that it was not the bits in the mouth so much, as the excessive pressure upon the occiput, or rather open part of the atlas, exposing the spinal chord, that had annoyed him, and had given him all this pain and dislike, and which explained to me the cause of many a fierce battle I had seen, between the horseman and his horse, even in riding-schools, but of which I never could till now in the least conjecture the true cause.

We now brought forth the mare to see how she would act under similar circumstances. This mare had always shown a most unconquerable aversion to the curb; and we remarked she was rather fully made, indeed swoln, on one side, about the lateral parts of the atlas, on the off side. On trying her with the snaffle, she carried her head pretty fairly round the school; and we remarked a circumstance of some import, regarding these snaffle-reins being pulled, they drew the bits upwards in the mouth, and consequently relaxed the side-straps of the headstal, and released her from much, or almost any, pressure against the occiput, which release would sufficiently account for her better carriage with this bit. We now wished to see how she would be affected by the curb-rein; and on drawing this rein pretty smartly, she in a very little time took to boring with her nose down to her sternum, nor could any thing raise her head. We then also discovered, on looking at the action of this curb-bit, that the ultra-central parts of it, that is, the cheek-piece, was really describing a circle round the centre, or mouth-piece, whose extremity described a radius of four inches, or more, and therefore of considerable power upon the headstal attached to it, so that when the reins, fastened to the lower end of the branches, were pulled, the headstal was powerfully drawn down upon the above tender point, being the very opposite effect to that of the snaffle, and therefore vastly contributing to render more offensive this detestable mode of biting, and which it is strange no one has appeared to have attended to or considered before; for although by prescription, or taught empirically, or by the routine of mere practice, the ancients seemed to have known these effects, it does not appear that they truly knew the cause; at least we have not yet seen any proof of it in their writings; and the discovery of which, it is to be hoped, may now open a new era in the conducting and management of this animal.

We now wished to see if it was as in the other case, the irritation of the bars of her mouth,

or of the *atlantal hiatus*, that was the source of her suffering. The headstall, that is the occipital strap, was now shifted right back upon the arch of the neck, when her course being continued round the school, she pretty immediately raised her head, and carried it to the proper angle, so that the bits would have their due pressure and effects upon her bars, and apparently with a cheerful feeling of acquiescence; demonstrating most clearly that it had been from the pain she had experienced from pressure upon this very delicate part, more so even than upon the bars of her mouth. As to the swelling we have just noticed on the side of the atlas, there was every reason to believe was occasioned by some former injudicious attempts to compel her by forcible measures to bear the bits, as it was supposed at least; but was in reality the miserable impression made on these most sentient parts; a sort of abscess had apparently formed in consequence, which in the end had become callosed.

In order that these facts may never sink into oblivion again, and, as it was remarked of old, that what passes to the sensorium through the eye, is quicker felt and longer retained than by any of the other avenues of sense; so there is subjoined a plate, indicating the actual condition, or structure rather, of these parts in the horse; and that there might be no mistake, represented as large as life; see plate 3, where the part marked *hiatus atlanteus*, gives the precise appearance this part makes in a full-sized head, where the gap, or exposure without bone of the spinal chord, and at its very base and origin, is so considerable as to satisfy any one of the misery of much pressure upon these parts, especially if the theca, or sheath of the chord be at all in an inflamed state, by which its sensibility is greatly increased; and if the parts directly over this interval should chance to be unusually tumid in figure, so will they then convey a greater degree of pressure than usual, to the parts immediately beneath.

There can be no reasonable doubt that they suffer often great inconvenience from the weight of a heavy log of wood, used in fastening them up in the stable, but which, if they expressed ever so great a dislike to, would hardly be attended to or understood, otherwise than by a scolding, or procuring them the whip or fork-handle.* At Fig. 11 is seen the *occipital bone*. 51, 51, the atlas. 2, The cerebellum, and arbor vitæ. 5, The spinal chord. 13, The basillary process of the occipital bone. 52, The second vertebra, or dentator. 9, The pineal gland, &c.†

It is obvious these parts, from the absence of bone to so great an extent, would be liable easily to be impressed and indented, and especially if a round body, such as a chord, lodged strongly upon them; therefore a flat web, and of considerable width, must be resorted to, or these parts must absolutely be pressed upon injuriously; but more skill and knowledge would be shown, as by the ancients, in avoiding it altogether, by going to the encolure.

* Some of my friends favourable to the spread of this kind of knowledge have removed from their horses in the stable the headstall that goes behind the ears, and substituted for it a neck-band over the dentator, or second vertebra; having a ring in front which connects with the musclet, and placed about one third of the distance from the eyes to the end of the nose. These gentlemen expressed themselves well satisfied with the change, and that it seemed to them more agreeable to the horses, as well as more secure. The log was suspended from the above ring, of the weight from two to three pounds of iron, and working in a recess boarded up from the litter, the chord or strap passing over a small roller, easily acting, prevented the possibility of its entangling the horse's legs, a most fatal source of mischief.

† The whole head of the horse, in two magnificent well colored sections, as large as life, by Kirtland, done from a preparation made by me about thirty years ago, with a description of the parts, may be had of the author, or Renshaw, No. 356, Strand, at the moderate price of £1 the two, with a description; or in quarto covers, half-bound, price £1. 5s., an indispensable acquisition to all concerned in the study of horses.



We next proceeded to the getting made a headstal, after the Greek and Roman fashion, to reach backwards to the neck, instead of its embracing the base of the ears, and with the frontlet also brought half-way down between the ears and eyes, instead of its binding up the throat and damaging the windpipe, it merely rested loosely upon the swell of the lower jaw, answering there efficiently every purpose designed by it. This frontlet was formed of one piece with the throat-lash, and crossed the lateral strap of the headstal at nearly right angles, or rather was inclining a few degrees upwards towards the throat, being fastened to the above strap by a stitching, which was ornamented outside at this place of crossing with a metal or leathern button. The mussole was also fitted on very loosely round the jaws, in the place we see it fitted in Roman biting, about three or four inches higher up than the corner of the mouth.*

The whole apparatus, when fitted on the horse, had a light, elegant appearance, and what was more, of comfort and science; and on its being weighed in a scale, was found to be little better than a pound and a half weight. We next promiscuously took from the wall of the stable one of the common head-gear for a coach-horse, having all its side-irons, loops, chains, mouth-pieces, upsets, straps, rollers, hook-rein, and tag, for distorting its course, loaded with heavy brass scales, as though for war; all this machinery, with its leathers hardened and swollen from the continual application of grease to them, when placed in the scale weighed between five and six pounds; and all this was to rest by a narrow strap, directly over the spinal or atlantal hiatus! need we be at a loss in accounting for the frequent occurrence of apoplexies and sudden deaths, and divers other anomalous and hitherto almost indefinable affections of the brain, and spinal chord, and its investing membranes, when such a weight as this was lodging directly upon a part so delicate, nay, almost mortal, and urged against it at times with the force of a short lever. I believe we shall now be enabled to throw considerable new light on these hitherto puzzling cases.

So painfully affecting to the horse indeed, is any violence committed to this tender region, that I myself once saw a stout horse of nearly sixteen hands high felled to the ground by the stroke of the handle of a small riding hand-whip, not larger than my finger; it happened indeed

* It may not be altogether foreign to our present purpose to relate in this place an anecdote respecting nose-bands, to put juvenile performers on their guard, where they find them employed with the headstal, at inns and other places, for the part is requiring more attention than is generally given to it, as the following adventure may serve to illustrate:

Riding one day from town to Hampton-Court, I there dismounted to refresh myself, and also my horse, which was led into the stable for this purpose; and his feed, as was my custom, I saw placed before him, giving him a little water, leaving the rest till he had finished his meal. Having taken my lunch, I again returned to the stable to look after my nag, and give him the remainder of his water; but, to my surprise, found he had not done his oats, so retired and left him awhile; when returning some half-hour after, and still finding his oats before him, and uneaten, and knowing him to be a pretty good trencherman, I began to look about for the cause, and casting my eye casually on his headstal and its nose-band, discovered that it had been rendered, perhaps made so, or by successive mendings reduced so small and tight, that the horse could not open his jaws—of course could not feed;—the ostler perhaps thinking in his wisdom, so long as it would go on his head, that was sufficient, not carrying his ideas so far as to the contingency of any action of this sort. I soon had it off, and to work he went with his mill, and quickly the oats disappeared; and my eyes were awakened to an abuse which had never before fallen in my way to notice, but might often happen, and had happened, I have no doubt, to many a poor beast before mine, who would be led to his work again without his meal, and exhibiting any weakness or ill-temper in consequence, would probably only have it met by stripes, or worse usage, and which might eventually have created a lasting dislike between the man and his animal.

to myself, in Hyde Park, the animal falling on his knees, and so badly damaging them, that it was thought, every thing considered, best to destroy him.

This tenderness, indeed, of the part, will account for many a resolute horse contending stoutly against such measures, in a way that often astonished coachmen and spectators, who never once in the least conjectured from whence or from what cause it proceeded.

The above accident in Hyde Park indeed, I may confess, happened unfortunately to myself; and I wish by this public exposure of it, that it may in some degree expiate the offence, having been ever very much attached to these animals, and therefore felt more severely the imprudence and folly of so thoughtless and intemperate an act, which, independently of these painful reflections, cost me dear enough, for the horse, a fine creature, was worth between forty and fifty pounds, but was so dreadfully injured that he was obliged, as I have said, to be destroyed. This painful narrative may have its use in putting others more on their guard against acts of violence towards these, for the most part, worthy, but at times, trying creatures. To make this confession a plenary one, I may also state, that his offence was a swerving and endeavouring to rub my legs against the gate-posts of the entrance of Hyde Park, perhaps from mere playfulness, certainly from thoughtlessness and want of care and attention on my part. A most useful volume to young beginners would be a collection of similar acknowledgments, especially if fairly related, and without embellishment or disguise of any kind. I knew the late famous Lord Chancellor, Thurlow, to have had a similar accident from a blow of the kind, given in haste, for his horse's tripping, in going along Holborn. It is related that in India, where elephants are employed in war, if by the missiles of the enemy they become ungovernable and dangerous, a man placed over the neck of the animal, drives with a hammer a nail, provided for the purpose, into this tender part, and he immediately falls lifeless to the ground.

The head of Aurelius's horse, given at page 17, 18, is seen also similarly accoutred in respect of the headstall, so that this practice certainly extended to the reign of the Antonines, from which period Gibbon begins his History of the Decline and Fall of this great empire. But in the sculptured figures of the column, inscribed to the Emperor Theodosius the younger, at Constantinople, and illustrated by Menetrier, we observe that the headstalls are everywhere resting in the common place, close behind the ears. It may, however, have been an inadvertence of the copyist, prejudiced by modern custom, and thinking this the proper place for them. If this monument still exists, it would not be difficult to ascertain the truth in this matter.

It would now be difficult to imagine or apprehend what may have been the amount of their suffering, from this very unscientific mode of harnessing them, and how many a painful infliction they endured before they submitted to it, independent of the pain arising from the act itself by the compression of these tender parts; for any resistance, where the cause of it was not seen, would immediately be set down for obstinacy, and be treated accordingly.

A thousand years of bitter persecution did this animal endure from his shoeing, before it was discovered that his feet were elastic, or that an iron ring and nails, falsely named a shoe, by pinioning the hoof too rigidly, was subversive of this very natural property. His jaws also were next applied to in like manner with abundance of iron, not to mitigate the sufferings of his feet, but by a severer kind of infliction on tenderer parts to cover up and make it less perceivable,

which, if not the true source and origin of these lever-bits we have been describing, at least encouraged their use, and his shoes became the cause also of abundant scourgings for defects in his going, for which the poor sufferer was in no respect to blame. Though far from destitute of feelings and of gratitude also for kind offices, in receiving such punishment he must have felt severely the ingratitude and injustice of it.

It is also harrowing to the feelings of any one not absolutely hardened by habit and custom to see that his miseries are often increasing with his increasing age, although by his past labours and services he may be said to have twenty-fold earned his life and cost, and to have obtained the right of dismissal from severe labour, or at least entitled to a merciful and easy death; yet often is he sold in this condition for a few shillings to the besotted and inconsiderate, and is again exposed to the hardest of labour, in his debilitated condition, and of the very severest and most ungenerous kind. Is not this taking an unfair advantage of the defenceless, and is it not disobeying the mild precept of his Almighty Creator and giver, of "Thou shalt not muzzle the ox that treadeth out thy corn," thereby clearly intimating not only that no cruelty should be exercised towards him, but that the most indulgent liberality and kindness should be extended to him. Surely funds should be raised publicly or privately to defray any such expences, and laws be enacted to do away such palpable injustice, although the awakened feelings of mankind will perhaps be his surer and better protection hereafter, than laws and statutes which few like the trouble of enforcing.

Some further Considerations on the Abuse of the Bearing-Rein.

It seems to be in the ordinations of the great and eternal Disposer of events, that no system should be permanent that has not gentleness, love, and harmony, for its basis and end; a doctrine the Scriptures inculcate, and is confirmed by the daily progress that is making in society, by ameliorations of every kind, leading to such a conclusion. The extinction of slavery, the formation of milder laws, of benevolent institutions, of peace-societies, are all tending towards this happy consummation. And we have it on the best authority, that harsh and rugged Nature herself will finally be subdued and changed; and that the lion shall eat grass as the ox, and lie down with the kid, and the child shall play unhurt on the den of the cockatrice, and that great will be the harmony of those days.

It must be afflicting to every feeling man who can understand it, to observe the gross cruelties practised on these worthy creatures; and which has been confirmed by long habit, till its enormity escapes notice or attention. Whence came the invention of the bearing-rein, I know not, but believe it is not mentioned in any ancient work, and that it is entirely of modern contrivance, heaped upon his other modern inflictions. The best pretence for its use is that it keeps the animal from falling, in which there is some truth; but I should say, what business have we to make a cripple of him, and to bring him into this condition with his feet, and then to punish him on account of it? My friends have found, when their horses were shod properly, and with a shoe that did not pinion the foot, that there was no need of this machine. No animal was ever made a tumble-down by the Almighty, it is man that operates this change in him by his absurd practices.

This instrument is hardly endurable in the hands of the intelligent, but in the hands of the ignorant it is almost constantly abused; it is therefore best removed entirely from their reach. When tightened and strained upon their jaws and lips, it is often more tiresome and painful than the infliction of the whip itself. It can compress, distort, and derange the functions and the very structure also of the air-passages and parts about the throat, and has been the death of many a good horse, without its being at all known or understood as such, and is producing the most painful obstructions and ulcerations in these parts, that without killing may last for life.

It is also worthy of our notice, that if you complain to a carman or coachman that his hook-rein is shamefully tightened, he puts his fingers to it directly and pulls it, to show you it is slack. Now, this sort of trial is no proof whatever of its not being too tight, since the animal is obliged to yield himself and conform to the operation, or severely suffer a worse infliction upon his jaws, and this he will do if pulled ever so tight, in order to mitigate its action. For what would that tightness be, I would ask, when the bones and ligaments were so set and fixed that there could be no longer any motion admitted among them, on being pulled by this vile machine? but on removing this rein you discover at once into what an abominable restraint the neck had been drawn, by the figure it takes on being set at liberty.

I well remember once meeting a man with a heavy load of stone in a cart ascending a hill; he could hardly get along with it, and was continually stopping: I told him the horse would certainly draw it more easily if he had the liberty of his neck; and for once this man condescended to listen to reason; he took off the bearing-rein, and the horse drew it to the top at once with comparative ease,* and, strange to tell, this man seemed also grateful for the hint.

Its abolition would be the saving of so much unnecessary furniture to purchase and to look after; and it is in a more especial manner that we address our brother veterinarians to discourage it, and to the public everywhere to check as much as possible such individual cases of its abuse as may occur. What occasion, for instance, is there for such idle machinery to horses employed in a heavy waggon, where the fear of running away with their load is not at all urgent, or of their falling, with such a weight to keep them up; and why diminish the power of their draft by taking away the use of their necks and fore legs? Of what use is such a machine to a horse in a dung-cart, where, from the extreme ignorance often of those so employed, we see them the most misapplied. No doubt the collar-maker can find good reason for its use, and so can the farmer's man, who takes in the bill; but many a better could I suggest to the farmer for not listening to these fancies, and for refusing its application. If they be thought ornamental,—mere ornament can be easily supplied, of a better and more innocent description, in various ways. Why also should we throw temptation in the way of these men of the stable to speculation, or to the indulgence of a spirit of abuse and cruelty? For it can be easily shown that all this sort of labour was done before its invention, and quite as well or better, without it.

* My worthy friend, John Field, jun., of Wigmore street, who has taken considerable interest in these inquiries, informs me he has again and again proved, by careful experiment, that his gig-horse climbs a hill with the bearing-rein removed much easier than with it on; and not only so, but that he did it in less time, and sweated less, when arrived at the top, than when this unnecessary appendage was applied to him, which there can be no reasonable doubt must very much oppose his progress, for who, to induce his horse to go, would pull at the rein?

Their eyes are often seen scintillating and flashing with pain and fury, and turning in their sockets, and retracted and dim with suffusion of blood, from a foolish imagination that their necks, crooked into half their natural compass, look handsome, and where done in a slight degree it may be so, but pushed to the point these men carry it, it becomes a hideous deformity to any man of real good taste, that is as to what should be the easy and natural appearance of the horse's neck, which properly, as the skeleton shows, is nearly a straight line; it is best then to leave it ever free to act, and unconstrained, at least as much so as is required or useful to him in his labours.

This practice of the crooking tag began by a few hackney-coachmen putting the bearing-rein most unnecessarily within the throat-strap, in order to distort it from its proper course, and to make it more severe, as we have before stated; and the collar-makers were not long behindhand in turning this to some account, by making a loop, or tag of leather, to extend from the ears expressly for this purpose of distortion, and variously ornamenting it, for I was witness myself of this being the real way in which the practice at first commenced.

When the rein is drawn backwards, the horse is always instructed to obey it by stopping; or, if further pressed, of going back himself; but here, in this strange contrivance of the hook-rein, he is expected to advance notwithstanding this contrary indication, and though pulled as tight as you please, or as fear or caprice can make it, yet, *bon-gré, malgré*, he is expected to proceed in spite of its effects, and with the same freedom and alacrity as though it was not there. Surely such a contradictory folly is hardly credible, or that an animal could be found to advance under such strong circumstances of contraindication. But what will not this docile animal do in endeavouring to satisfy and please his master, or what will not the fear of the lash accomplish? although it must at first excite, no doubt, his just indignation by its perplexing effects; and that he bears it, is no proof of his not severely suffering from it.

It was remarked, in a former part of this Essay, that the curb caused the horse to carry his head low; and we are fully disposed to believe that the very first use to which a bearing-rein was ever applied was to counteract this effect, and that afterwards the idea of permanently using it to keep him from falling suggested itself, and induced its continuance, and became indeed its chief object; and getting into general practice, its first intention was entirely lost sight of. For the degrading admission, that his horse was liable to come down, was avoided in every way possible, and by every subterfuge, as derogating too much from the merits of the animal, and as diminishing his value; therefore, this mode of preventing the accident was eagerly caught at, and its nature but little canvassed.

Another miserable effect of this rein is exemplified in the following case, which I was witness to on Holborn hill. A very fine gig horse in a showy gig fell down, in going down the hill, to the very great injury of his knees. I saw the horse trying his utmost to recover himself whilst in the act of falling, and which he certainly would have effected, but his head, neck, and fore-legs were nearly made useless to him, owing to the pinching-up and pulling-in of this bearing-rein, so that he had in fact no room to act!

A loose bearing-rein, like a loose curb, certainly is no very great evil, but the abuse is so inviting and easy, that it is not a fit instrument to be trusted in such hands. And the more so in the total

absence of all schools for instruction in these matters, so that every one has to learn for himself, and perhaps not without first committing some gross act of abuse upon the animal, which awakens him to reflection, and teaches him to avoid it. It is greatly to be regretted that there should not be proper schools for obtaining this very necessary knowledge, and that a testimonial of competency be required before a man might mount the box, or be admitted to handle the animal, or even enter a stable. And such schools, consisting of a barn, or any simple square building, would be sufficient, in every city or large town, where it would create a useful employ, and would effectually suppress most of those enormities which have been but too long suffered to prevail.

On Mounting the Horse.

HAVING a blank page or two left, instead of their remaining unoccupied, we are led to bestow them on the subject of mounting the horse, although somewhat foreign to our original purpose of the bits. The stirrup, though now become an article of horse furniture of so familiar a kind, that to call it an invention would almost appear strange, yet however was it not known in Xenophon's time, or for five hundred years after; and during this epoch men vaulted into their seat on horseback, at least those who possessed strength and agility enough to do it, without any auxiliary provision, of which we see an actual representation taken from an ancient medalion in the British Museum where the horse, See Pl. II. *fig.* 8, instructed probably so to do, is putting out his fore legs forwards, which lowers his back to the rider, and thus facilitates the operation of mounting; as he is placed however on the contrary side from what is usual, it is clear he must mount by his left leg, for if he threw his right over, it is obvious his face would then be presented to the tail of the animal.

However those who had higher horses to deal with, or who possessed not this agility, mounted by the spear, *ἐπὶ τοῦ δόρατος*, as Xenophon expresses it. One of these spears was found some years back in Athens, concealed behind an old interior wall of a great public building, and is seen represented Pl. II. *fig.* 1, being furnished or provided with a loop of leather on the side, into which the soldier's foot was inserted, when he nimbly vaulted into his seat. One is seen represented in the very act of thus mounting, at *fig.* 7, Pl. II, taken also from an ancient paste or medalion in the British Museum; this man however is placed different to the other on the left or near side of the horse, as in the usual way of mounting.

Besides these means they also had *Upping stocks*, or *stone steps* or *blocks*, for mounting their horses by, placed at convenient distances along the streets and causeways. The great also possessed their lackeys, or slaves, who attended their masters on these occasions, and who, stooping down or kneeling, gave opportunity for them to mount upon their backs. When stirrups became invented, this sort of subserviency was represented by holding the stirrup in the hand for to mount by; and kings, on some occasions formerly, subjected themselves to this degrading ceremony, in thus assisting the Romish popes.

The first representation of a stirrup, that we know of at present, is seen on the Bayreuth Tapestry in the Archæological Society's rooms, supposed of a date a little anterior to William the Conqueror; see Berenger, Pl. VII, *fig.* 2. It was of a very simple figure, being almost a

regular triangle; and this stirrup was fitted to a more than usually solid *ephippium*, indeed nearly resembling our modern saddle but raised before and behind like a pack-saddle, no doubt with a tree and proper iron frame and loop suspending the stirrup; before this, a simple soft housing, or *ephippium*, ill calculated for carrying a stirrup, though sometimes gorgeously ornamented, having been in general use.

The third ancient cameo, Pl. II. fig. 6, is a very curious article; to be seen also in the British Museum, being part of Baron Stosh's Collection; and represents a soldier, as appears by his helmet, in the act of kneeling down to fasten on the *spartum* or broom twig shoe, or which is more probable, the *hippopodes*, or leathern sock of the ancients, often defended with iron, and which probably gave rise to the modern horse-shoe; they fastened it on, not by nails, but by bands round the legs, which he appears to be in the act of grasping in order to its more close application. See Absyrtus's description of this kind of shoe, in *Treatise on the Shoeing of the Ancients, and of the Invention of the Modern Shoe*, second edition, p. 20, where they are actually seen on the legs of three horses. The *spartum* shoe we have remarked was probably only used for keeping on the dressings to the injured or abraded feet, and not used as a defence against the roads. For further particulars we must refer the reader's attention to the above treatise.

On Equitation.

Verbum.

WE are again induced to fill a small remaining space of blank paper with a digression, which like the former, is but remotely connected with the subject of bits and biting; and which relates to the seat on horseback after we are mounted. It was written above thirty years ago, while attending the riding-school, and may perhaps, to be perfectly accurate, require further correction. It appeared to me at the time to be the chief principle or groundwork for the seat on horseback, in practising the various changes of attitude required in order to keep a firm seat, whether in his rearing, kicking up behind, or in going over, the leaping-bar.

The successful practice of this art will, we believe, be better understood and entered upon, by first recognizing the foundation of its principles, that of a lever having two centres of motion, either of which is liable to be called into action with a body placed in the centre between them.



Thus we will suppose this lever placed horizontally, which is not however entirely inflexible, but possessing some degree of elasticity, which flexibility though small, will cause the re-action to be less felt by the rider, and to be more pleasant and agreeable than if perfectly rigid, especially where such movements or changes are very sudden.

The art of riding then, or of keeping a firm seat, in its general principle, will consist of this simple axiom, to keep the body always as nearly as possible in a perpendicular attitude to the centre of motion, in whatever posture the horse may assume,—and since he can only take three or at most four positions, they are easily comprehended.

While, for example, the horse is on all-fours, the centre of motion, or rather of gravity then, is in a perpendicular line to the earth between the fore and hind legs, under the seat of the horseman, as seen in *fig. 1*. In the horse rearing up before, the centre of motion becomes transferred to the hind legs, and the acetabulum, or socket of insertion of the thigh-bone in the haunch-bone, becomes the centre of motion. Now it is to be observed that the centre of motion is the part of the body having the least motion of any, and the rider, to be safe, must place himself therefore as nearly as he can in a line with it, by which any great jar, concussion, or projectile force is avoided.

If on the contrary, the horse should lash out very high with his hind legs, supporting himself on his fore, the centre of motion will then be transferred to about the middle of the shoulder-blade, that being the point on which this limb librates, and the rider's body should, to be safe, be disposed in a line with it by throwing his body backwards in order to avoid any violent concussion, or projectile force, which he would infallibly experience in any other attitude.

This principle however, like most general principles, must, we believe, give way to certain modifications; for as these two centres of motion are very high up in the limbs, it is not easy to sit so as for the body to be perfectly opposite to them. Some might contend therefore that the foot fixed on the ground would afford a more proper point to aim at; others again might contend, and which we believe would come nearest to the truth in actual practice, that a line drawn at half-way between these two points would be a more safe and easy approximation to the truth, and would sufficiently secure the seat of the rider. This remark, however, appears to apply more particularly to the hind than to the fore legs, when those are advanced forward under the body, by which the hind quarter or croup is sunk down, and so favours the rider in the application of the rule; and it is necessary further to observe that the body only of the rider, that is down to the very bottom of the loins, is to take this direction, leaving the fork and legs ever fixed and straight in the stirrups and saddle, or nearly so; for it will be found, I believe, that a slight rotation of the fork or *pubis* upon the saddle will inevitably accompany this rise of the lever of the horse's back against the body, and also we should observe in strictness of fact that instead of one there are two centres of motion acting, that is the sockets of both hind legs, and that this lever of the back is carrying the weight or body disposed between them. Now all these movements are very much facilitated and softened by the great flexibility of the limbs, and the yielding of the back to accommodate the burden. *Fig. 2* gives the situation of the acetabulum or centre of motion of the hind limbs; and *fig. 3*, that part of the shoulder round which the fore limb librates.

In the act of leaping, all the three positions are performed. On approaching the bar, as in *fig. 1*; on the horse rising you lean forward as in *fig. 2*, and on his coming down on his fore legs on the opposite side of the bar, you take the position as in *fig. 3*. However, without much attending to the principles of it, the practice of these rules become familiar enough to those who ride standing upon the horse, as at shows and theatrical representations.

When the horse moves sideways, in what is called the *Passage*—the only other motion he is capable of, worth noticing at least,—the centre of motion is then, as when on all-fours, or in going backwards or forwards, in the common line of gravity between the hind and fore legs.

In rearing and plunging you have a quick succession or transfer of these centres of motion, making the seat difficult, which though in time and practice you learn to adjust yourself to, you will certainly accomplish it more certainly, and in less time, by previously understanding the principle of doing it. For it must be evident if a man sit in any other direction than the one prescribed, he will be thrown by the laws of projectiles immediately from his seat to the ground. The first motion, that of leaning forwards in proportion as the horse rises, is almost natural and instinctive, but the other, that of leaning backwards, is acquired with more difficulty, and has cost many a tumble.

ADDENDA ET CORRIGENDA.

Page 8, line 28, after *true*, *ins.* The famous Greek poet Pindar however, ascribes the invention of horse-educating to two of their fictitious deities, viz. Prometheus and Mercury, the latter an acknowledged king of pilferers, or their deity rather, and the other it may be suspected was not very much better, perhaps coined for the purpose of more conveniently robbing the poor Egyptians of the honors of their invention, for they undoubtedly first instituted these arts.

P. 8, l. 40, note, after *equus*, insert, And we have proof of its having been very anciently written by the Romans with an *o*, *Equos*, which remarkably serves to confirm the above etymon, but not reducible to any declension in this state, it was made into *equus* with the nouns in *us*, of the second.

P. 12, l. 2, after *chin*, *ins.* and therefore did not use one.

P. 12, l. 9, after Xenophon, *ins.* *πρωτον μιν τοινην τον ρυταγωγια χρη εκ της υποχαλινιδας, η εκ του ψαλιου ηρτημενον εντρεπη εις την αριστεραν χειρα λαβειν.* Hippique. Ed. Leunclavii, p. 942; meaning, as I suppose, “In the first place then (do) thus; take the leading rein out of the cheek-ring, or from the *psalion*, or chain under the chin,—extending it ready to be received into the left hand.” It is also pretty clear, that as no other bits or reins are here mentioned by Xenophon than this *rutagoge* or leading rein, it was used also for the hands after mounting, and that it was therefore, it is fair to conclude, a simple snaffle, which to make a guide rein of, had been crossed, that is the off rein had been brought through the loop of the *psalion*, or one of its links, or, as our grooms do, as formerly noticed, through the ring at the cheek on the near side, thus bringing both reins to the same side, which sufficiently explains the directions given. Our modern cavalry have the piquet rein a distinct rein, coiling it up when not in use, hanging it to the side of the head or front of the saddle.

P. 13, l. 6, after *conjoined*, *ins.* these are all perhaps from the Latin verb, *teneo*, to hold, a root probably of eastern origin in both languages, which has been found of late to be very extensively the case, viz. from the Sanscrit. —Also *μας*—*αντος* appears to have been much used by Homer, and was therefore a very ancient appellation for the reins.

- P. 13, l. 19, after error, *ins.* Although I since observe Leunclavius has it also, "*ima pars fræni.*" See p. 942. Hence also in the English translation of Xenophon's *Hippike*, which is understood to have been done by Governor Pownall, 8vo. London, 1802, the same expression appears, "fastened to the lower part of the bit," which is quite unintelligible; neither was it "fastened" to the psalion or chain, but simply hooked to it by one of its links, or suspended by a small ring, hanging probably from about its middle part, under the chin.
- P. 13, l. 24, after been, *ins.* I apprehend that an actual representation of this ancient article may be seen on the mouth of one of the horses very distinctly given in Menetrius's Illustrations of the *Columna Theodosiana*, see Tab. I., in a solemn procession. It consists of an iron muzzle, made of numerous straps of plate-iron, crossing each other at right angles, and apparently forming a sort of basket for the nose, though it is obvious it might have been very variously made, both as to material and form, as of twigs or hemp; it agrees also well with the ancient account of it. *φίμοι* enim os claudebant, erantque craticulatim ex funiculis viminibusque, plexi sacculi corbesve, quos vocabant fiscellas Latini, Græci aliàs κημοες, Scheffer, p. 181. Sometimes it was only a mere band round the nose, to prevent their opening the mouth.
- Ibid. l. 28, after it, *ins.* Sheffer had at one time nearly seen the true state of the case, but afterwards obscures the subject again in mistaking the long piece of iron, which he calls "*ferramentum longius ab ore dependens,*" seen extending from the warriors bit, Pl. II, *fig. 3*, for the *apochalynidia*, instead of giving for it the *annulus*, still nearer the mouth, and out of which it might conveniently be taken, but certainly not out of this solid iron branch, see Lib. I. p. 173; the above branch we shall have occasion to revert to hereafter, and to consider more attentively. It would have been uncouth in its effect if so applied, and there is also evidently no provision for it.
- P. 16, l. 38, after us, *ins.* This was accomplished perhaps by a ring or upochal passing through these perforations, which hanging loose received the reins, and also the headstal and chain or psalion, under the chin; or there might have been two rings for this and the foregoing purposes, as in the former bit; or, a cheekloop alone for the headstal, as in the former bit.
- P. 17, l. 30, after ornament, *ins.* See *fig. 4*.
- P. 19, l. 6, after artificers, *ins.* or finally it is possible that this exterior collar or prominent rim, had a screw on its internal surface, and that the metal plate being made thin at its outer edge, was screwed into it, urged by a square key fitting the above notch.
- P. 19, l. 14, after centuries after, *ins.* The last remark we shall make on the Herculaneum bit is, that the cheekpiece for the headstal, &c., being formed into a square, only wanted a tongue to constitute the modern buckle, of which it might have been the progenitor, at least if such was not then known, of which I am not assured. And with that accession it would make a very near approach to our modern furniture in this one respect, while the rude cross-pieces in the bit from Silbury Hill would make a nearer approach to it in another respect.
- P. 21, l. 38, after simplest bits, *ins.* of horn or wood.
- P. 23, l. 22, after a word, *ins.* for what we absurdly call the bridon they call the *fausse rein*, our snaffle being their proper bridon; so that a man riding with a curb and snaffle exhibits at once the bride and bridon of the French. Without presuming at all to dictate, however, I may just observe, that in order to avoid all confusion and ambiguity, if the French were to use the terms *bride*, *bridon*, *bridonette*, and *fausse rein*, then our parallel or strictly synonymous terms to them would be, *curb*, *snaffle*, *snufflette*, *hook rein* or *bearing rein*. Snafflette being used in this case to signify the short

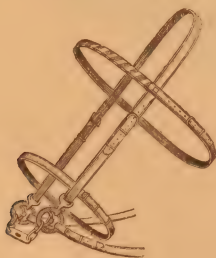
reined military snaffle lying on the horse's neck in ancient armour, as seen in Pl. II, *fig.* 2, 3. We should then have a distinguishing term for each of these bridles ourselves, and an intelligible harmony or synonym and concord between us and the nations of the continent.

P. 27, l. 19, for bits, *read* branches.

P. 31, l. 22, note, after obtained, *ins.* As words are the signs of ideas and of things also, by which we are to think and reason, so is it of essential consequence that as a basis they should be correct or the superstructure may suffer. I may here once for all just advert to my often indulging in philological remarks where the matter seemed to call for it and were, I believed, not generally understood; when thus impelled I have done it in the briefest manner and smallest compass of words that I could devise so as not materially to enlarge the work by them. On this occasion there seems a call as I apprehend for this sort of interference in respect to the two words *curb* and *kirb*; obviously distinct and from different sources yet confounded generally as the same or rather one is made to occupy the place of both. It is in fact the Norman French which has in many cases rode over and confounded our Saxon words of similar sound. Now the French word, *courbe*, signifies any thing that is curved, bowed out or with an arched outline, from the Latin, *curvus*, signifying the same thing, and is very duly and properly applied in the disease of the hock of the horse, where the parts from strain and violence have suffered, become swollen and callosed. But the word *kirb* which is of Saxon origin and a most proper and useful English word, signifying quite a different thing, viz. restraint, or the retention of any thing in its place, as the kirb-stone, kirbing the passions, &c. and is generally written *curb*, although a very distinct word and the *k*, should by rights we believe be used on this occasion. Our great lexicographer Dr. Johnson seems to confound them as one, giving absurdly both the senses though perfectly opposite, to the same word, I therefore just give a hint here at this perplexity. If any should be tenacious of still retaining the *c* and rejecting the *k*, they might distinguish the two words by spelling one with the French, *courb*, and the other, *curb*, for assuredly they have no relationship in origin, sense, or meaning.

P. 34, note, line 2, after intended, *ins.* for how can anything be made "fresh and cool" by being sawed and punished.

P. 53, l. 16, after rollers, *ins.* blinkers, brass bosses.





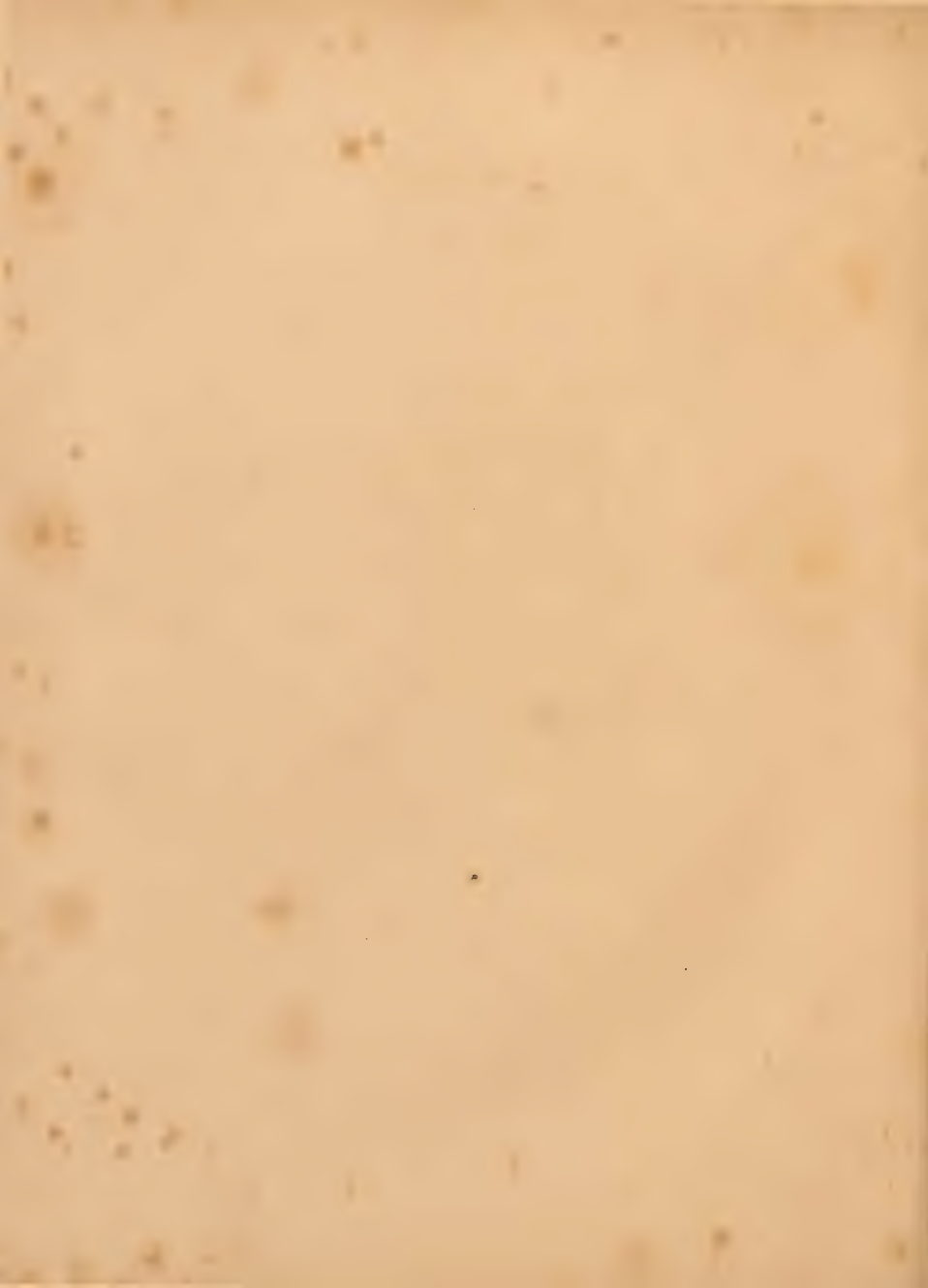


*Occipital Strap resting on the Neck
the Mare being removed*

elastic band

labeled

MY MARE BITTED ACCORDING TO MY ARRANGEMENT.



A DESCRIPTION
OF
THE GRIPES OF HORSES,

AND
OF A BETTER MODE OF TREATING IT;

ALSO,
HUMAN CHOLERA EXPLAINED;

SHEWING ITS IDENTITY WITH THE ABOVE, AND A MORE SUCCESSFUL
MANNER OF TREATING IT; ITS HISTORY, &c.

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CURIOSORUM OF BERLIN, FRANKFORT, STUTGARD, COPENHAGEN, &c.

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ON
THE GRIPES OF HORSES.

THE object of this small Essay is to give a more intelligible account of this dangerous disease, and to establish the treatment of it on more certain and less precarious measures than hitherto have been used, for very various and often contradictory and quite incompetent have been the means resorted to by the public on these sudden emergencies, by which a protracted suffering was occasioned to the animal, and also but too frequently a fatal issue. One should apprehend it must ever impart agreeable feeling to be able with tolerable certainty to relieve a noble animal from excruciating pain, and ourselves from the severe loss which his death is apt to occasion, and which we propose to do by a more energetic, combined, and more consistent mode of treating the disorder.

The medicine, also, here recommended, is, we apprehend, new as to its application to horses, and we may also observe that it has hitherto been employed only as a secret, and confined pretty much to those who have learned its use under my roof, and who have carried it thence to various parts of this kingdom, and to the continent of America, whither they have settled, and have proved extensively its beneficial effects, which to me also have been confirmed by a period of practical trial, more prolonged than the poet's precept* enjoins, before I have ventured to make it known.

In making it thus public I also cheerfully relinquish the profits which the sale of it among those who had been witnesses of its effects led to purchase it, and also avoid the charge of an empirical practice, hoping sincerely, that now the veil is about to be withdrawn, and the charm which mystery ever imposes is about to be removed, it may not cease to please, for, great surprise and an extraordinary degree of satisfaction often attended the exhibition of it whilst a secret, and we wish that it may long remain to be a welcome resource on these frightful occasions: I could desire also, in promulgating it, to give a caution

* Nonum prematur in annum. HOR.

against the abuse of it when its use has become familiar, first in being too confident, and next perhaps too careless in the exhibition of it, by which it might fall into disrepute, and disuse, and finally be lost again, as has been the fate, I believe, of many a valuable discovery. Let me here also add, that it is not by the medicine alone that these effects are at all times produced, but by a conjoined and concurring mode of treating the animal in assisting its effects, which in difficult and protracted cases is more especially necessary to ensure success. Publishing it also affords me the opportunity of advancing some new views and opinions respecting the causes and nature of this complaint, which are more true, perhaps, than many found in the writers of the present day, and which may lead to a more useful kind of knowledge even than the remedy, that is, the measures necessary for averting the frequency of it.

I acknowledge I was often unsuccessful in the early part of my practice in this disorder, if the attack was very severe, though using all the then known remedies and means of treating it : embarrassed and uncertain also of what should be the primary object in its cure, sometimes fearful by stimulants of inflaming the bowels, and rendering the disorder more fatal, and so avoiding the use of them : at other times attending only to the diminishing of the pain by anodynes, at others believing that patience and mild measures were the best to be pursued, and in this state of uncertainty what real course to take, the patient was lost ; believing at last, from noticing their effects, that the true road to cure lay in a bolder use of stimuli, I was determined to push them more vigorously, and to pursue them till relief or death was obtained, setting aside and almost disregarding all other indications or apprehensions, till this was effected. For though the same means nearly have before been often employed by the public, yet when done feebly and not repeated, or too late, as was often the case, it failed of success, and they were also frequently counteracted by pursuing confused and contradictory measures along with it, not consistent with or supporting the remedy ; which causing it often to fail, left uncertain impressions on the mind as to the plan that ought to be pursued, of which we have sufficient proof at this hour by the very dissimilar nostrums and modes of treatment recommended in books daily published.*

* For the general views and apprehensions regarding this disease at this period I may refer the reader to St. Bel's Treatise on this complaint, and also that of the Veterinary College seen at the end of his treatise on the Eclipse horse, and of divers other persons whose labours have been dispersed through the country.

To give clearness to what I have to communicate respecting this disorder, if I rightly judge, it will be best first to state two or three unsuccessful cases, with their treatment, as formerly practised, and the appearances after death of the parts concerned; and afterwards a few successful cases, and the remedy and treatment used with them, and conclude with some remarks of what appear to be the proximate and predisponent causes of this singular disorder, and the manner of operation of the remedy; and finally subjoin an account of some other diseases which come near in their symptoms to this complaint, so as to be easily mistaken for it.

In the commencement of my practice in this city I had extensive opportunity, especially among the large breweries, of witnessing this disorder; and it was often painful to see its destructive effects, which caused my joy to be the greater when I found I could, with so much certainty, control its fatal progress.

The following case, among others, occurs in my book of recorded cases for the year 1801.

A horse was seized with the gripes at the large brewhouse of Meux, Reid, and Co., at about half-past five in the morning, at least it was then first discovered by the men coming to the stable, and might have been going on all the night, and as this horse was situated not far from the door, indeed almost opposite to it, I had reason to believe the door had been not properly closed, and that cold air blowing upon him in the night time, had produced the attack upon a full stomach; so that the disease had partly gone through its natural course before it was detected. The symptoms were, frequent lying down and getting up again, and rolling about in great agony; he often stretched himself out, and would turn his head and direct his eyes towards his flanks with expression of agony, as though indicating where his pain lay; a cold clammy sweat was upon him when I first saw him at eight o'clock, and a farrier near at hand had given him a cordial ball with aniseed, and left him to his fate, and about nine he died; so that the disease might be fairly said to have pursued its natural course.

I was desirous to see him opened, and found a most extraordinary thickening and inflammation of the *cæcum*, as though a general rupture of the vessels and membranes of this intestine had taken place, and the blood was lodged between its coats; the inside lining of the intestine was almost black, the outside comparatively but little inflamed. The intestine itself contained a

great deal of ill digested and ill masticated food of beans, oats, and ill chewed hay, mixed with a bloody water, or red serum, which had probably been thrown out from the distended arteries and vessels which at length were ruptured by the inflammatory action. The small intestines were not much affected; here and there a patch of inflamed surface.

The stomach was whiter I thought than usual, and freer from blood; probably the blood had been drawn away from this part to the inflamed portion of the intestines, or had been in a state of spasm.

Whether in this case the disorder was brought on from voracious feeding, and not sufficiently grinding his food, or in consequence of exposure to cold from open doors or windows, or both causes combined, we are not assured.

The second case I select occurred in a stallion, taken ill at Islington, while in the dray. He was brought home about three o'clock in the afternoon: I was soon after sent for. Here the symptoms were the most violent, and the pain and inflammation went on in the most rapid way I had ever yet seen. A ball with opium was immediately administered: his sides were rubbed with hot cloths, wrung out of hot water, and we endeavoured to give him a clyster, but in vain, his pain and rolling about afforded but few opportunities to introduce the pipe, and then the clyster was rejected without passing a foot's length into the gut, a contracted state of the intestines appeared in the most effectual manner to close all entrance or exit to the intestines. After warm ale and spices, and other things of this sort had been given him, he died in great agony about nine o'clock.

We immediately opened him, and found the *colon* and *cæcum* highly inflamed, and an immense quantity of ill chewed, undigested food within, and a large quantity of greenish red water, and some air. Here the cause evidently appeared to be indigestion; and from the horse-keeper I understood he was a very voracious feeder, and had been several times seized in this way before, but not so violently.

July 27th, 1800, I was sent for to a case of gripes at the same brewhouse, a brown dray horse; he was not so cruelly agonized as in the preceding cases: he stood up much, sometimes lay down, and rolled about but little.

I gave him a ball, containing two drams of spirits of turpentine; I expected it would have induced staling, but during an hour that I stood by him it did not operate in this way. I ordered him to be well rubbed with straw, and we took a broom stale, and two men rubbed him under the abdomen with con-

siderable force. This not relieving him, and as he began to swell at the flanks, I had him covered with cloths, and run up and down the yard. This, however, did not relieve him, and we next forced in copious clysters of hot water. These however were immediately rejected in the same state they entered. We raked his fundament, but no dung was lodged there; we clystered again, and held down his tail, with straw placed underneath to make him retain it, and we could in this way often get in three or four syringefuls without any escaping; but when at last it was forced out, it gave no signs of having entered the intestines, at least far enough to do any good, as it came out much as it entered, bringing nothing with it.

At this period I was in uncertainty of the true cause of gripes, whether it was spasm, strangulation, or inflammation of the bowels or stomach, or both, and whence it proceeded. I was afraid if it proceeded from indigestion to remove much blood, lest it should weaken the powers of the system, that should be in full vigour to operate relief. I was afraid, also, of giving strong things in much abundance, lest they should add to the pain and inflammation, that I was greatly at a loss how to act; but this and other cases seemed now to prove that indigestion was certainly the primary cause of the mischief.

In the above case, finding nothing avail, I was next induced to try the old nostrum of the farmers in the country, of gin and pepper, and whilst he was exercising in Gray's Inn Lane, half a pint of gin mixed with half an ounce of pepper was given him by mouth, and he was led home; and by the suggestions of some spectator, an onion was placed in the fundament; for I was willing to lay aside all theorising, and try any suggestion that might be proposed, however ignorant it might appear, as sometimes chance or accident has led to a means of relief; but the onion had no sensible effect. Warm water clysters and salt were next given him, but these also seemed to afford no relief. At the suggestion of one of the proprietors a dose of calomel was next administered, as this had been found serviceable in a case of some stoppage or obstruction of the bowels of a lady. I administered it with some aloes, in the dose of half an ounce, but without effect; he died at seven the same evening, being thirteen hours from the time of his first being seized, and longer by seven or eight hours than in the other cases.

I paid much attention to this case, and found it necessary to endeavour after some more effectual system of treatment, as these nostrums were evidently uncertain, and the losses severely felt. I observed that it usually took place an

hour or two after feeding time, or in less time than this, which seemed to indicate pretty plainly, its being a suppression from some cause of the digestive act, and that this was immediately succeeded by the commencement of a chemical one, in this way the air was produced, which by distending the intestines, and the food becoming dry, irritates them, and brings on the inflammation of the bowels, fills the flanks, and produces the intolerable suffering; for it is certain there is present in the abdomen all the ingredients or agents necessary for a brisk chemical action; viz. vegetable matter, as hay, or corn, or both; also water, the animal secretions of the stomach and bowels, and plenty of heat.

Now as the chemical ferment begins as soon as the proper animal process of digestion ceases, so the cure appeared to depend upon bringing on again the suspended digestive process, which, if the stomach is still excitable, and the intestines not actually mortified, may be generally hoped for and effected. The earlier therefore the treatment is begun, the better chance, though I have seen them perfectly restored after seven or eight hours, or longer, and the attack is often more advanced than we apprehend, as the animal will not show external indications till the pain becomes considerable, and then they may, from various casual circumstances, not obtain immediate attention.

To effect this purpose more fully, of restoring the digestive process, I looked for some remedy effectually stimulating, and determined to push the use of it without intermission, till relief was obtained, or the termination of the case in some way. The reproduction of the digestive process seemed the indispensable object for the cure. I knew none more likely to produce these happy effects than the *pimento* berry, joined with a fair share of ardent spirit, but lowered so as not to produce a direct inflammation or caustic effect upon the stomach, for I was quite decided that gentle means, in very many cases, were quite inadequate to the business, and therefore the remedy should be recommended to be kept in all large stables, ever ready and at hand, that the moment the disorder appeared it might without loss of time be applied.

On opening the above horse we found that the inflammation was not confined to the large guts, but that the *ilium* and *jejunum* were also sufferers; some balls of dung were found about the middle of the *ilium* that had the appearance of having undergone a strong compression, and some of these balls appeared externally red with blood. The commencement of the colon contained a large portion (two hatfuls) of almost dry, undigested grain and hay. This had probably become dry through the excessive heat and inflammation, or

it might have been that the animal had not been presented with the requisite water or moisture for consummating the digestive process; I do not undertake to determine which, but care in this respect seems necessary in those who feed them. Though it be a known fact, that animals have the power of giving the due pulstaceous consistence to the mass in the stomach, before it passes into the intestines, and this whether it has been given with or without fluid, yet the excessive privation from watery fluids, or a peculiar febrile state of body, may render this more difficult, and the quantity often in the horse's stomach of food is very great. The stomach, however, was found full of hay, and of a good healthy appearance, and by no means too dry; that this part did not participate in the mischief, or its powers had been reinstated, but not so the intestines. This I was the more surprized at, as I had not observed him to eat any thing from the time he was seized. In this last case I also observed a gangrenous patch, as large as my hand, on the colon, the only instance I recollect to have seen it in the horse. All the internal lining of the intestines was like a mass of red sponge, drenched and filled with dark grumous blood.

This horse seemed to look about earnestly, as though desirous of something. I offered him both hay and corn, but he would not touch either. I have since thought it might be water he sought for, or, as I have seen in other cases of disease, it was simply expressive of a desire after help. Water might in these cases be administered warm with good effect, especially after the violence of the attack had subsided; if given with the remedy there is danger of its diluting it too much, and weakening its effect.

Such were the appearances after death in these fatal cases.

In another, a chesnut saddle gelding, where the disease had run out six or eight hours before help was applied for, the administration of the medicine only served to protract the death, he dying at the end of fifty hours. His stomach, the red part of it, was highly inflamed, and in one part mortified, which had ruptured, forming an opening as large as half a crown; one of the small intestines was dreadfully inflamed, and one of the large intestines (the *sæculated* colon), in which the contents appeared like chopped hay, mixed with reddish chocolate grounds. This appearance was perhaps occasioned by the vessels distending from the inflammation, and rupturing, poured out their black contents among the food, which at first, perhaps, or previously, had been nearly or quite dry.

In order to the pursuing my plan of a high stimulant kind, and repeating it at short intervals, till the digestion of the food was obtained, or the disease decided; for I began to apprehend that nothing short of the reproduction or return of the digestive process would save the animal; I prepared therefore in readiness the following tincture:—

Pimento, 1 lb.

Water and spirit of wine, each three pints.

These were allowed to infuse for several days, and might be strained off, or be allowed to stand together till their use was required. At first I employed the pimento mixed with other spices, and administered it in a ball, and poured gin or other spirit into the stomach after it, but as the first case treated in this way did not succeed, I had recourse to the tincture, as more immediately active, and not creating the delay that the solution of the ball in the stomach would demand; though in the above case it did not cure, it produced a great alleviation of the disorder for the better, so much so as to determine me more vigorously on the next occasion to pursue the same plan; and this I was encouraged to do, as I found the remedies, though potently administered, had not sensibly inflamed the stomach. The fatal symptoms of dilated nostrils, quick laborious breathing, cold sweats, cold breath, stupor of the eyes, *vultus pigrities*, or the constricted distressful countenance, and death did not in this case take place for more than twenty hours; the suspension, therefore, and remission of the complaint was evident. In the next case, therefore, I proposed advancing with more boldness to these means, as to the only hope.

When indigestion from any cause takes place in the human body, it is situated generally in the stomach itself, and the remedy immediately is applied to the part affected: but in these animals it would appear, that as it is chiefly in the *cæcum* and intestines, its influence is by a secondary process, by the sympathy between this intestine and the stomach. Setting aside all theory, however, it appeared evident from the suspension of the complaint during more than four hours in the last case, that it was the right course to pursue in order to the cure. The pimento I preferred to the other spices, as being of a warm, stimulant, aromatic nature, and cheaper and more easily procurable every where than the others.

It may be remarked, that too large a quantity of food at one time in the stomach, more than can conveniently be digested, will lead to this complaint, and especially in horses that have been many hours at work, and return

in a debilitated state through fatigue; for it appears that horses do best with a little at a time and often, and of this we are instructed by observing them in a state of nature, almost continually feeding, unlike most other animals. Hence, perhaps, is the reason of their having no gall-bladder, the flow of bile into the intestines being almost incessant; and for an animal destined to be fleet to have a loaded stomach would be a great inconvenience; and an overload of food must be also injurious with horses going to work.

Another fatal case occurs in my notes for 1801, the record of which may be useful, in which I administered all the usually proposed remedies,—cordial balls, sweet spirits of nitre, tincture of opium, tincture senna, tincture gentian, which protracted, but did not save from the fatal conclusion, nor were they administered with any method or system. He lived, however, nearly two days and a half, that the struggles between death and the remedies was brought to a nice poize.

It may be a matter of some curiosity also to know what the cunning Greeks thought of this complaint, and how they treated it.

The veterinary writers of Constantinople, as *Apsyrtus*, *Hierocles*, *Hippocrates*, and *Anatolius*, and others, have termed this disease *Στροφος*, *Strophos*, as though the gut was somehow twisted, or perhaps from the animal rolling about. Apsyrtus recommends clothing them, raking the fundament, and the herb *Centaury* to be administered with wine and oil, a glass of each warm, and then to be exercised. If these avail not, *myrrh*, *opopanax*, and *seeds of apium* to be given with the Indian Moss (*το βέβρον*), or the *Chelidonium*; and in order to make him stale, he is to be rubbed over with wine and oil, and the same given as a drink. He is to be fomented with warm water, and barley meal to be given him.*

Hierocles recommends an egg broken in the mouth, and swallowed shell and all!

Hippocrates gives a good description of the disease, and recommends his being kept in a warm place, with warm lotions and warm coverings, and five drachms of myrrh in six gills of old wine to be administered through the nose or mouth. After this drink he is to be exercised, but not vehemently, or with long intervals. If it can be got, let him have for food plentifully of *apium*, and warm water to drink. After raking him, let him be led about, so as to induce sweating. Afterwards pounded seeds of *Nasturtium* to be given him

* *Scriptores Græci Veterin.* p. 148. *Ruellius*, p. 57.

through his left nostril.* Let him be covered with cloths, and the herb *Medica* be given him. Also shavings or raspings from the front hoofs, let him be drenched with, in four hemina of water, or the earth taken from the shrew-mouse's hole is to be pounded and given him. What a wretched mockery of assistance must these last articles have been, and what a state of folly and superstition do they indicate!

Anatolius follows much the same line of recommendation, but without any description of the disorder. Among other things four whole eggs with their shells to be forced down the animal's throat! *Wild rue*, *figs*, and *onions*, *nitre*, *pigeon's dung*, &c. to be placed in the anus, as *Collyria*. How many a wretched horse must have suffered by such treatment!

These ancients appear to describe this complaint under another name, *καίλια*, *Choilia*, the chapters relating to which should have been added, it appears to me, to those of the former on *Στροφος*, *Strophos*, by Ruellius, as being one and the same disorder.

Pelagonius has given a chapter thereon which is curious, as preserving the prescription of Celsus for it, which, as his work is lost, is the most considerable vestige perhaps remaining. It is however singular, that though inserted in the Latin translation, Ruellius has omitted it in the Greek text edited by him, as is the case with some other pieces also,† “Of the *Pontic root*, *pepper*, *garlick*, *petroselinum*, *fennel seed*, *black pepper*, *horehound*, *mugwort*, of each an ounce. *Dill seed* a scruple, *libisticum*, *centaureum*, each an ounce. *Ajuga*, half an ounce; *eupatorium*, a sixth part of an ounce; *pennyroyal*, *rue*, *apium seeds*, each an ounce; *ginger* half an ounce, *honey* two pounds; let them be pounded together dry, and sifted into the honey, and kept for use. A ball, the size of a hazel nut, to be given in warm water, when the disease requires it.” How insufficient must these measures have been for cure, or even alleviation of the disorder! Given at least in the dose here prescribed, and the loose manner also of the exhibition, otherwise the prescription is well adapted to the purpose, and is the best among the ancients, and better than the treatment in our modern books of farriery.

In respect to the Romans, it is also matter of curiosity to observe their proceedings and knowledge of this disease.

* There was a charm imagined in this, for it does not present so well as the right nostril for this purpose.

† Ruellius, fol. 42.

The early writers of the Romans who treat of the management of their villas or country seats, as Cato, Varro, Palladius, and Columella, hardly make mention of this disorder.

Vegetius has largely treated of this complaint, but under various names and in a very confused manner; his best account is in Book I. Chapter 42 and 43, *Cura longanionis et Ilei. Causæ et Curæ Strophæ*. He mixes also, without any notice of it, the diseases of cattle with the diseases of the horse. He recommends warm fomentations to the loins, and putting hay wrung out of hot water upon the loins; rubbing them well with hair-cloths, and diligently anointing these parts with oil, tar, and laurel oil made hot, and also their testicles; and a warm medicament to be poured into their ears: these to be continued till he sweats and emits wind, which indicates a remission of the disorder. To let him stand in a warm place and be covered with sacks, and receive daily the following drink, *pepper, petroselinum, Alexandrian and African cummin, seeds of apium, myrrh, nepetam, trixaginem*, mixed with half their weight of *nitre*, well wrought together with warm wine, and oil, and honey. He farther proposes what appears an excellent plan, *bags filled with hot bran* to be placed upon the loins, and clysters of warm water, oil, salt, honey, and nitre. And pastills (if there shall be no opportunity of clysters), made of pounded salt and honey to be placed in the fundament; which he observes, will draw away the sharpness of the humors and lead to health.

In the second, or latter chapter, *Causæ et Curæ Strophæ*, he recommends the operation of puncturing the abdomen four inches below the navel towards the sheath, cutting through the skin, or integuments, and the peritoneum, but to carefully avoid wounding the intestine.*—Next he orders a pipe with small perforations to be inserted to draw off the humors!

He again notices this complaint under the term, *Emphragma*, Lib. I. cap. 47, and again cap. 48, *De Ileo*, and cap. 49, *De dolore ventris*, and 62, *De Strophæ*, and also Lib. III. cap. 52, where he has given us the above quoted prescription of *Celsus*, which *Pelagonius* had given, but it begins with *Anisi Pontici* instead of *Radices Pontici*; in other respects similar. Lib. III. cap. 57. he again enters on this complaint, copying imperfectly the prescriptions of *Anatolius*, to which he, or some one for him, has added *hares' dung* and *pepper*

* How the air is to escape does not appear; and this chapter seems designed for the hoven cattle.

as a drink. Finally, cap. 59, Lib. III. he appears to be copying the description before given of *Hippocrates*.

We shall now, in pursuance of our proposed arrangement, give the short history of a few successful cases of this complaint in which the new remedy was used.

On the 9th of the sixth month, (June) 1802, I was called up early in the morning to a horse that appeared actually dying of the gripes, having been seized in the night; I administered immediately about four ounces of the above strong tincture, which I mixed with a little water; after waiting twenty minutes no relief appeared, and he seemed in extreme agony, as much so as I ever had recollected to have seen, stretching himself out, lying down and kicking most violently, his skin cold, his breathing laborious; I immediately ordered a quarter of a pint more to be given with a little water, and for him to be well covered with cloths from head to tail; this not giving relief in half an hour, I ordered another quarter of a pint to be thrown down with a horn, as the former was, and a clyster of water with a handful of salt in it. His pain, however, increasing, or not at all abating at the expiration of three quarters of an hour, I repeated the dose, disregarding all apprehensions about inflammation; I then left him half an hour, desiring the assistants to keep the cloths upon him, and to repeat the clyster. I returned after about an hour, and found him laid stretched out on his back, cold, and apparently dying, (I had also ordered him to be bled,) his blood had coagulated, exhibiting much buff: * considering him as lost, I quitted him for other business for one hour, and did not expect on my return to see him alive, he lay in a state apparently insensible, stretched out with his mouth open. I made him get up, and as he seemed in less pain, that we might not lose the ground we had got, I ordered him another dose of the tincture, with the addition of a little *oil of peppermint*, as being a strong and diffusible stimulus; I next gave him two quarts of warm water, and a hornful of warm water to be given him every hour, and I ordered him again to be bled, when the blood exhibited but little or no buff, which made me doubt if the spices and spirit might not have some power in checking this formation. I ordered again more of the stimulating tincture, with the *oil of peppermint*,

* I mention this circumstance as being contrary to the usual appearance of the blood in this complaint, *which is without buff*, and from which I conclude some inflammatory action was going on in this case, probably peritoneal inflammation.

though in numerous cases since, I have found it as efficacious without it. I desired he might be again clystered, and gave him a gentle dose of *aloes* to increase the action of the intestines and induce them to discharge their contents, and left him for that night; at ten next morning I found him on his legs, and he had dunged once during the night; his dung was hard, dry, and on the outside bloody; where it had been in contact with the intestines, it appeared to have been embraced and imprinted by them very strongly; these balls of dung when broken were highly offensive, and contained much unchewed and badly chewed corn.

As this was as severe a case as I think I ever attended, it satisfied me that even in the very bad cases we ought not to despair.

1802, 9th month, 20th. I was called in the evening to a horse that was extremely ill of the gripes, pawing with his fore feet, lying down, getting up, and continually restless; sometimes kicking with great violence. This case, as it resisted the medicine for three or four hours, I much despaired of; it at length yielded to the steady and repeated administration of the medicine, but not till after nearly three pints had been used. As soon as he got relief, he began eating, and perfectly recovered, nor had any return of his complaint. After that he had been ill four hours, I took two quarts of blood, which coagulated without any buff. I had him bled again the next day from curiosity to observe if any buff was formed, but none was found.

Without describing more of these cases in detail, as they are much of the same complexion, and the particulars of treatment are given at the conclusion, I may state, that during six years that I afterwards attended the horses of this brewhouse, and other large brewers in London, out of very many cases I lost but one, which unfortunately happened from being seized in the night, and the complaint had pretty well gone its natural course before the remedy was administered; and I remember in particular one case at Calvert's brewhouse, which I attended, and where seven hours had elapsed before the application of the tincture, and which, after resisting it six or seven hours more, and was often given over as dead, recovered, to the admiration of every one concerned. And the testimonies published, with the direction at the end of this treatise for using the tincture, will show how successful it has been at other breweries, and many farmers, waggon owners, and others, could bear the same testimony, as also now some of my brother veterinary surgeons.

Two stages sometimes belong to this, as to most other disorders; the first

is the *Strophous* stage, or that of simple gripes—and next, the *Enterital*, or inflammatory stage. In this it should be particularly noticed, that copious bleeding, fomentations to the abdomen, and extensive blistering of the integuments becomes necessary; warm water plentifully by both extremities of the canal, and other means of subduing *Enteritis*, perhaps saline purgatives. It will be obvious, however, that unless the cause, which is the undigested mass, be previously acted upon or removed, this can nought avail.

We are now led to advert to the causes of this disorder, and rationale of the cure, as far as we have had time to consider it, well aware how subject this part of the Essay will be to change with every new shade of light brought upon the physiology and pathology of animals, which each succeeding age, for a long time at least, will view differently.

The tendency to this disorder in these animals, more than in others, we have thought may be accounted for, in some degree, by the vastness of the intestinal canal, which in the horse is exposing a prodigious internal surface to be acted upon by the food, which can maintain and support its living actions upon it with the more difficulty. The intestines we have also thought are thinner in proportion to their magnitude in the horse than in the generality of animals; whence from slighter causes the process of chylification, &c. is the more subject to be disturbed and suspended. Also, the abdomen in these animals presents externally to the elements a vast surface, which if wetted by showers, or chilled by currents of air, will lead more readily to such effects as these; hence a frequent source of this complaint with dray-horses is, the stopping in the streets or at the doors of taverns to drink or to deliver beer, a shower of rain or a cold wind happening at the time, will presently bring it on, and especially if the animal is sweating, and still more easily if he has been lately fed, or has voraciously fed, or without due mastication: therefore, in rough weather they should have a cloathing for the loins when so exposed. We have also thought, that in these animals there is comparatively a more scanty covering to the intestines of *Epiploon*, less so than is given to most other animals; in the human this part is of very considerable density, and with copious store of fat lodged in and about it which keeps the bowels warm, and which provision would have been perhaps incompatible, or not so suitable, to a very fleet animal. In hogs the fat is enormous. The mischief of the disorder, we see, is chiefly in the *cæcum* and *colon*, and that it is in these large intestines next the skin, and most exposed to the parietes of the abdomen, that it takes place.

Horses that sweat much at their work, either through impatience or debility, will be found also very liable to it.*

This disease can also be brought on in another way. A farmer's man brought his cart into my yard for a load of dung, he threw down before his horses some hay, and gave a pail of cold water to each; one of them in a few minutes after was seized with the gripes, he refused the food he was eating, and wanted to lie down, continually shifting his posture; the man was going to run him about, I however ordered him into my stable, took off a cloth from one of the horses, covered him warm, and in less than half an hour, without any thing else, he recovered. Here the stomach only must have been affected, which is, perhaps, the simplest mode of the complaint.

To the measures or directions given at the end of this Essay may be added, rubbing the abdomen briskly with the hand, if practicable, without removing the clothing, by putting the hand underneath, and if the hand was covered with a flannel glove, or small flannel bag tied over it, the friction and warmth would be increased, and it might be the better, and this, though simple, is, I believe, powerful in its effects. The tincture can be aided also by *Pellitory, horse-radish, mustard*, or other stimulants, if it shall not be thought stimulant enough, though simplicity is ever to be recommended if it answers the purpose.

We now conclude with stating a few diseases whose symptoms so much resemble *Strophos*, or gripes, that they may be mistaken for it.

Coactio, or Gorged Stomach. A case of it. A dray-horse was subject at times to indigestion and griping pains from weakness of stomach, as it appeared, which left him again without the assistance of medicine; one day, whilst

* In summer time this complaint more easily happens, probably from the general relaxed state of the animal fibre, and of the intestines and stomach also at this season. This may account for the violence and frequency of the cholera in India; where these parts have less power from its exhausting influence. In the summer time also, I think I had more patients than in winter: is it that the animal fibre generally is more exhausted and relaxed, and more susceptible of a remission or suspension of function owing to the violent heats, and therefore of less power to resist it? The cholera also in the human, invaded countries more in summer than it did in the winter, and it commenced also with us at the decline of the summer season.

delivering beer, and exposed to a chilling north-easter, he was taken very ill, reeling about and endeavouring to lie down; he was led by the dray-man to a farrier near at hand, who called it the gravel, and gave him a drink, as he said, proper for it;* instead of coming home and administering the gripe-tincture immediately, as he ought to have done, he continued several hours out; when he came home I was sent for, and I watched him some time, and apprehended from the symptoms that it was a mild attack of gripes; he pawed now and then with his fore feet, but not violently, lay down, and after a few minutes resting got up again; his breathing was agitated but not violently, his eyes fixed, and staring, and watery, expressive of internal suffering. He sweated about the neck.

I ordered him warm beer with ginger in it, apprehending, as the attack was not violent, it might suffice; the stable to be made as warm as possible, and several cloths to be thrown over him, his stall to be well littered down; if not relieved in an hour, the gripe tincture to be given him (which they omitted to do), and he passed the night much in the same manner; in the morning the gripe tincture was administered, and he was bled, which seemed to relieve him very much; his symptoms all returned however, and his breath and saliva, which frothed out of his mouth, became very offensive, and I then began to suspect it was a case of gorged stomach; I ordered plentifully the gripe tincture, a blister to the abdomen, glysters, warm water, warm clothing, and vinegar sweetened with honey; all however availed not, and he died on the fifth day after the attack; opened, his stomach was found unusually distended with food, which he could not digest. Charles Clark informs me it is now much the practice of the common farriers, and others, to give large quantities of castor and other oil, without hardly knowing why or wherefore, and the stomach becoming gorged and paralysed, and prodigiously distended, has frequently caused the death of the animal.

Chordapsus, Ruptured Stomach.—When the stomach ruptures, its contents

* Which is mercifully removed by his provident Creator from the catalogue of his sufferings, the horse not being subject to this purely human disease. Any accidental foreign body lodging in either urethra or bladder will generate a deposit round it resembling, in many particulars, human calculi, as may be seen in the *Journal Pratique* for May, 1830, one formed being on an oat lodged in the urethra of a gelding, the other by an almond in the bladder itself of a mare: good figures are given of them, and an analysis. Also the fecular mucilage of the bladder forms a coherent mass sometimes, in neglected horses, to whom, as I supposed, little or no water had been given.

pour out from the nose and mouth ; I never saw a case of this kind, but I record it from the report of my esteemed friend, Frederick Nash, who was present at a case of this sort when living at Cambridge. Death immediately follows. A stomach I once found ruptured, but whether from external violence after death by the slaughter-house men, in carting or uncarting the carcase, or that it took place during life, I know not ; the symptoms were those of gripes, but the skin colder, and no vomiting took place ; the intestines were in this case inflamed : bad heated ship oats were the alleged cause of the attack.

Enterocallus. Intestinal Balls, vulgarly called *Calculi*, are generally found in the pouches of the *colon* after death, and have no relation whatever to real *Calculi* of the bladder ; they sometimes move from their sacks or pouches during the life-time of the animal, when *Enteritis*, or inflamed bowels, and death generally follow. A case was related to me by a distinguished brewer (Sampson Hanbury, Esq.), where two or three of these balls came away, and the animal perfectly recovered. Though heavy and stone-like, these balls burn to a black light friable coal, and are formed very much of animal gluten. The *rectum*, also, has its peculiar balls, which are mostly very rough with rounded nodules, and with vegetable fibre-like hairs, and often these nodules have some foreign body, as bits of iron, mixed in their centre. The balls of the *colon* have generally also some foreign body for a nucleus, as bits of stick, &c. ; those from South America, called *Bezoar Stones*, have bits of the ends of the branches of some fir or pine-tree, as I found on opening several of them. Millers' horses, that eat much bran, mixed with grit from the mill-stones, are particularly subject to these *enterocalli*. I may just state also, as a rare occurrence, that the yellow mucilage, which renders turbid the first urine of the horse, being deposited in the bottom of the bladder, and therefore flowing out first, has been found reduced to a solid mass ; but this is in no respect like the human *Calculus*, or gravel, though by some it appears to have been urged in proof of it.

Introsusceptio Intestinatorum.—In the case of a gentleman's coach-horse at Hampstead, which died before my arrival, I found, on opening, a piece of the *jejunum*, of about a foot in length, mortified and black ; ordering it to be drawn out, I observed it had been received into a piece of the adjoining gut, whose cavity it filled by inversion ; the intestines contained a thin bloody humor of a deep red colour, no undigested food was seen in the large intestines.

His symptoms they stated resembled the gripes, but with unusual chillness of the legs, and prostration of power.

Strangulatio Intestinorum.—I casually saw opened, at Baker's slaughter-house, Cow Cross, a horse that had suddenly died, and I remarked the intestine was twisted in two places, at about eight inches distance; at these places the intestine was white, and free from inflammation, perhaps owing to the pressure, but above and below of the deepest red, and the inflammation extended through a long course of the gut, almost to the *cæcum*.

Pleurisy especially, and *Peritoneal Inflammation*, are also attended with excessive irritation and acute feeling in the horse; kicking with the hind, but more especially with a rapid and continued pawing of the fore feet, that might be mistaken for the gripes, by those unaccustomed to the complaint. We are now about to conclude this Essay on the gripes with bringing forward ample testimonies of credible witnesses, men of veracity and understanding, and who were deeply interested in the saving of their valuable animals from a painful death; and also the testimonials of men eminent in the veterinary profession itself, who have admitted how much they augmented their professional reputation by their prominent success, and the satisfaction they gave in the treatment of this dangerous complaint; their joy indeed, was almost unbounded as they related their conquests in this respect. But, instead of giving these testimonials here, we are now compelled painfully to speak of treacherous concealment, in noticing the miserable conduct of one who has been highly paid for teaching, or pretending to teach, this science of the horse, but who, though bound in honour to assist every effort of advancement in this respect, has miserably from sordid interest thrown back that progress he was engaged to forward, recommending to the unsuspecting youth a different course of treatment, and the substitution of a base article for the one fully proved, well known, and found to be a most efficacious remedy.

Imagining no doubt, although absurdly enough, that if one stimulus would do, so might another, as though all stimuli were the same, and therefore, that spirits of turpentine might do as well as the gripe tincture, that was known and fully proved to do, and the consequences, as we shall see, have been deplorable.

Not content also with this worse than folly, and the concealing of the real remedy, he must change also and mystify the very name of the disease, substituting for it the high-sounding but foolish epithet, of spasmodic Cholice,

instead of the very simple, expressive, and unambiguous term of *Gripes*, which could never err or mislead, inferring thereby that spasm was a leading cause or character of the malady, but which may perfectly well exist without any spasm at all, though it sometimes accompanies it, and when it does is the mere effect, not cause, of the violent pain, distension, and suffering which the parts undergo from the presence of the complaint. Indeed, this old-fashioned term is to be found, like many others used by the professor, in the farriery book of old Gibson.

We shall now refer to a case exhibiting the blessed effects of giving this acrimonious, fiery, essential oil, as a substitute for the gripe tincture, which is seen very innocently related in the "*Veterinarian*," vol. ii. September 1829, p. 348, and which, in conversation sometimes, for pre-eminence of distinction, we have designated, *the Royal case*, for it actually occurred in the King's stables. Here this fiery substitute was poured in most confidently at both ends of the intestinal tube, and the consequence was, entanglement of the bowels, as we should have expected, and a most excruciating and horribly painful death: to the great chagrin and mortification of the Royal master, who, as it was one of the noblest animals of the Royal stud, never cordially forgave the individual who occasioned it, but exhibited much disgust and aversion.

Now in more than fifty cases which we have known, and been present at, and which were treated with the gripe tincture, some of them of the most obstinate and frightful description, we never had a case of entanglement accompany the treatment we have laid down, but if we are not to be believed, we shall bring forward presently the testimonies of others, who, as individuals, are no way interested in the result, farther than by the desire of the advancement of science and of truth. And we should state that this horse of the King's was also "*run about*" under his sufferings and treatment, as stated by the director of it himself.

Another and very similar case occurred also at the barracks at Knightsbridge, and with the same fatal results.* Another case so treated by another dupe

* Opium in considerable quantities was given in this case, which we mention to observe that as being a strong sedative, it would only serve to paralyze the actions of the stomach rather than stimulate to the return of a wholesome digestive process; and in its secondary effects upon these animals, highly inflammatory, that it helped to the disastrous result we fully believe—merely given probably to ease pain, which can only be duly accomplished by a return of the digestive act, the main thing to be kept in view in the proper treatment of this disorder. Copious bleeding

of the Professor's, one Cartwright, occurs in the very same number as the first of these cases, and also with the like fatal results, but though a mere case of gripes, is pompously introduced to us, and without any sufficient reason assigned for it, as a case of *Peritonitis*, a name of high sound, but from the description given, was but a mere case of indigestion and gripes, and such as would have readily yielded to a few doses of the medicine here pointed out, at least together with the conjoined measures recommended to be used along with it. Indeed, at last, they got rather shy of admitting they were gripe cases; and in this way I received, in a communication from Calcutta, an account of no less than three cases, each having a fatal result in much the same way, but ashamed to acknowledge they were cases of gripes, they called them cases of *rupture!* and without mentioning names at all, for I can have no invidious desires towards individuals I never knew, but who, as *Vitellius, Otho, Galba, neque beneficiis neque injuriis mihi cogniti*. I can have no desire to expose farther than the proving of my assertions requires, and the desire of improving our art, and of saving from intense suffering a most worthy animal by a repetition of those acts. In the above periodical I think I have seen not less than twenty, if not thirty, cases of gripes under one name or another, as seemed best to suit the notions and ends of those who sent them, many of which were grievously protracted by being messed with, under the name of medical treatment, some terminating favourably, others ending fatally much in the same way we have above described, but which it is clear to me and others also, might well have been saved had they had an intelligent, straight-forward, judicious treatment; not but what in small and trifling cases the disease will yield to almost any treatment, indeed some as we have formerly seen, even to none at all, farther than the covering of the animal with a rug and keeping him warm.

also at the early period of the disorder, as it would diminish the powers of the system that were wanted in full force to reproduce the digestive act, we condemn, though on the next day if inflammatory symptoms appear it might be necessary, but which truly seldom occurs. "*Running about*" was also pursued in this unfortunate case, which was evidently treated without any consistent clue to guide him, and therefore by administering medicines, various, opposed, and contradictory in their effects, as opium and spirits of turpentine, was distressing to the animal and leading to the fatal conclusion. And so the king suffers the loss of a valuable horse, or rather indeed the nation, whose business it will be to make good the deficiency, and this treatment, be it observed, was in the year 1828, and twelve years after the publication of my Treatise, pointing out, with simplicity, and without any very ostentatious claim, how this dire disease almost with certainty might be relieved and cured.

We therefore, without pursuing further this line of remark, quit it for some further useful suggestions, as we hope, respecting the nature of this dreadful malady.

At its very commencement, arising from depressing causes, or the want of power in the parts concerned, there appears to exist little else but a languor, inertness, and deficiency of action in the intestinal tube and of the chylo-poietic function, which inertness and suppression of power and action causes the food to operate upon the parts after a new and inordinate fashion, almost indeed with some particular food more especially, as a poison would do, and then quickly succeeds a most tumultuary, disorderly commotion in the parts in which chemical effects are mixed, producing, in strong constitutions more especially, plenty of gas; and next violent irritation and distension, and frequently, from the resistance of the bowel to these, spasm; at length these actions, if not timely arrested, terminate in a violent inflammation of the surfaces acted upon, and indeed which is passing through the whole thickness of the bowel, and the death of the parts, or mortification as it is called, quickly ensues.

Now if during this tumultuary, or disorderly action, the poor animal is forced from his bed and warm clothing, and be "*run about*," the chances are many that there will be an interlacement, knotting, or entanglement of the bowel, or intro-susception, and a fatal issue. In the case of intro-susception, I related, in the early part of this Essay, I knew nothing of the treatment that had been pursued, the horse being dead before I arrived, but believe he had been "*run about*." In an evening ramble in the Regent's Park, about four years ago, I saw a fine horse being "*run about*" for the gripes: I begged and entreated of them not to persist, but all in vain; their reply was, "the farrier had ordered it." The next morning I found she had died in the night, for it was a mare, and with a fine foal at her foot, which died also. Now that warmth and stillness should be preferable to "*running about*" and to exposure, will be readily inferred from what we have already stated in a former part of this Essay, and which we shall not repeat here; and we may also see what is to be expected from pouring this fiery fluid into their bowels on these occasions.

And now, for a few moments, let us consider what great advantages are promised to the practitioner himself by this abominable change, and substitution, farther than a useless endeavour for a short time to obscure and pass over an individual on the "O no! we never mention him" system, who never

did otherwise than wish well to the rising profession, and who has laboured night and day to promote it. Why, that instead of employing an elegant, simple, and efficacious pharmaceutic formula, a genuine tincture, which on these perilous occasions ought to be supplied only by the veterinary practitioner, for his own peculiar benefit and advantage, and the obtaining that confidence and satisfaction of his employer which a cure in these terrible cases never fails to insure : the owner of the horse, put up to the trick, runs off to the first paint shop he can find, and out of the dirty Can provides himself with the remedy. But when in his possession, supposing it to be admissible, for want of the knowledge of the disorder itself, and of the concomitant measures necessary to make the remedy in difficult cases succeed, he fails in the result, loses his horse, and the other his best practice. And surely the professor with his thousands a-year for teaching what he never knew, need not envy me my small rewards for making, or disclosing rather, this discovery ; for though hundreds of horses in opulent breweries, in the stables of coach proprietors, in the army, and in the very valuable racing-studs, have been cured by it, I never received the recompence of a sous for my lucubrations from any one of them. The worthy professor gets his twenty guinea fee for his teachings, and that's enough ; but what is to be said for those who choose rather than open their eyes, to be thus blinded by him, and will not inquire ?

We believe it not unfrequently happens, that no sooner has a new and valuable machine, or medicine, been discovered, if it be made public, some forward charlatan, eager to embrace the benefits of it, and to take the advantages to himself, proposes a substitute, and declares it better than the thing tried and proved ; the public, inveigled into the use of it, and not finding it answer, are led to reject remedy and substitute together, and thus is it lost again. The following little anecdote may not be without its use also. Passing one day accidentally through the abode of one of these dupes of Professor Coleman, I observed on a shelf of his stairs, a bottle labelled *Gripe Tincture*. Somewhat pleased at the sight, and with the reflection that all were not equally his dupes, at least to follow all his absurdities, I was passing on, when, suddenly struck with the paleness of the fluid contents in the bottle I stopped to examine it more attentively, and on inquiry what it might be, not without some hesitation, was answered, that it was spirits of turpentine and water ; a precious combination certainly, thought I, of immiscible things, and had it been administered, and a failure

had followed, it would, there is every reason to believe, have been pretended that it was a failure of that which the label announced, that we could wish a little care should be used in attaching a too implicit credence to reports from the wilfully blind.

To pass my poor labours by, as only affecting an insignificant individual, might be but a very venial offence; but why so many noble horses should be sacrificed, and why so many inquiring young men should be misled, and cut off from that reputation they might otherwise have acquired by an enlightened and secure practice, does not so easily find an appropriate excuse; and what shall we say of this veterinary periodical which, during ten years, has never once alluded to such a publication or a remedy so invaluable.

I had, I thought, just reason to hope for some kind of acknowledgment from the Veterinary College, considering its professed object, if not from the rich companies of the proprietors of horses, whose profits much depended on the well-being and labours of these useful animals, particularly the heads of the breweries; but being disappointed in one or two that I first tried, I disdained farther application for what had been to them the saving of thousands, two or three horses upon an average dying yearly of this complaint in these large establishments, and their fine splendid horses, costing often from sixty to eighty pounds a-piece. And this treatment, once known upon principle, it is not likely ever to be lost again to all posterity.

TESTIMONIES.

Guernsey, Oct. 11, 1837.

I FEEL bound to bear my testimony to the unfailing efficacy of Mr. Bracy Clark's remedy for the Gripes and treatment given in his excellent Treatise.

The principle on which he acts is so clear, that in more than thirty-five years' practice I do not know so satisfactory a cure. I have uniformly employed it since it was first made public by Mr. Clark, and cannot help considering it as one of the most valuable contributions to veterinary science that this or any age has produced.

I am, Sir, with much respect,

WILLIAM MOGFORD.

Veterinary Infirmary, Giltspur-street, Oct. 6, 1837.

From the commencement of my practice in this metropolis, or during about ten years, I have been in the constant habit of administering the Gripe Tincture as recommended by Mr. Bracy Clark in his "Pharmacopœia, and Treatise on the Gripes," and found it invariably successful, and often when, from neglect, the case has appeared almost hopeless; and I may safely aver that I never lost a horse under this complaint.

A remarkable case occurred to me in a valuable blood mare belonging to Lord Dundas, which was brought two miles to my Infirmary early in the morning of the 11th of July, 1836. She was suffering with violent gripes, and, from the groom's account, of several hours' duration, perhaps the whole night, for she seemed much exhausted. It was one of the very severest cases I ever knew out of a great many. We administered, from hour to hour, no less than six drenches of the Gripe Tincture, observing also the concomitant treatment laid down, and up to the last almost she appeared getting worse, sweating profusely, rolling about, and plunging most violently until she was nearly blind by bruising her head, breaking her way out of the loose box, and in the opinion of several she was in a dying state. But adhering strictly to every measure which might conduce to the one object we had in view, I had the satisfaction, about two o'clock in the day, to see her lie quietly for about half an hour (she being all the while warmly clothed), and then rise to her manger hungry, and begin feeding. She was much reduced and disfigured, and I then bled her to avert the possibility of inflammation, and the next day she was sent home.

The pitiful conduct of the College has been to recommend, since Mr. Clark discovered the Gripe Tincture, the spirits of turpentine for the cure of it, but it appears rather to act as a vesicatory and caustic than as a healthy restorative, inflaming the delicate membranes and linings of the œsophagus and stomach, and in a case where I saw it had been administered, the lips swelled, and the cuticle peeled off. Some have given camphor, laudanum, and common oil, in large quantities, and the animal has died from an indigestible mass of this kind, which I found on opening after death. The Gripe Tincture I have always found safe by itself, certain, and satisfactory, never requiring any addition, or was attended with any difficulty. Neither has any case of strangulation occurred in my practice, though I have seen such brought to the slaughter-house, apparently a consequence of the ill-treatment of Gripes.

CHARLES CLARK, *Veterinary Surgeon, 17, Giltspur-street.*

Also the undersigned Gentlemen have given their testimony of the Efficacy of this Medicine for the Gripes.

Brewhouse, Shoreditch, April 30, 1814.

We can safely bear testimony of the efficacy of the Gripe Tincture for horses, prepared by Mr. Clark, not having lost a horse with that complaint during several years that we have kept it in the stable ready for use.

T. M. & R. PRYOR.

King's Arms Brewhouse, Whitechapel, London, May 5, 1814.

Dear Sir,— We think it a justice due to you to state, that it is now about ten years since we first used your medicine for the gripes in the way directed, and we have not lost a single horse with it, although we have had several desperate cases.

We remain respectfully your friends,

To Mr. B. Clark.

JOSEPH & SAMUEL TICKELL.

Having lived with Mr. Clark nine years, I can safely aver, that since his discovery of this medicine and mode of treatment we have not lost above two cases, and then only when the disease had run its course before any medicine was administered, as may happen through neglect, or to horses seized in the night, or very far from home, where they were not provided with the medicine; we have seen a horse cured by it seven hours after the attack, and a very violent one.

JOHN PAYTON.

April 15, 1814.

DIRECTIONS WITH THE GRIPE TINCTURE.

WHEN a horse is seized with the gripes, he should be immediately led into a warm stable, where no draft or air can blow upon him, and the doors and windows be kept shut; throw down plenty of straw for him to roll upon, and well clothe him all over with rugs, or sacks, or any other warm clothing that can be got; and if these are not at hand, two or three trusses of straw should be employed to constantly cover him when he lies down.

As soon as possible let him have the fourth part of a quart bottle of the gripe medicine given him, which is sufficient for a drench; wait twenty minutes or half an hour, and if he is not easier, give him a second drench, though it frequently happens that one is sufficient; at the end of an hour after the second drench, if there are indications of great pain, let a third be administered, which in some violent cases may be required, and even a repetition of it every hour till he shews signs of recovery, which will be the longer if he has not been attended to soon after the being seized, or according to the degree of violence of the attack, and the nature and quantity of the opposing obstacle to the return of the digestive act.

Whether standing up or lying down, let him be well clothed with rugs or any kind of covering, in this way a perspiration is often brought on, which should on no account be checked, (though the drenches are best administered to him standing up.) It is useful, though not absolutely necessary, to give a glyster of half a pail of warm water, with a handful of bran and the size of a nutmeg of soft soap rubbed together and squeezed into it, or the same of oatmeal, or in case these are not at hand, a small handful of common salt; raking the fundament of dung is also in some cases of use, but is better omitted than to do it by much exposure to the cold air. He must not be walked about, nor any rubbing be used with a stick, but if the hand covered with flannel can be conveniently introduced under the clothes by rubbing the abdomen, it will be very beneficial.

After all the painful symptoms have ceased, or on the following morning, if he refuses food, or any other appearances indicate the remains of an inflammatory action existing, two or three quarts of blood may be taken from the jugular, or neck vein, which will subdue it. If he feeds on recovery from the attack, which they are apt to do, warm water should be given him to drink, and a warm bran mash, and good meadow hay only, for the next twenty-four hours, especially if the case has been violent.

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As soon as possible let him have one-third of a quart bottle of the Gripe Medicine given him, which is sufficient for a drink; wait twenty minutes or half an hour, and if he is not easier, give him a second drink, though it frequently happens that one is sufficient; at the end of an hour after the second drink, if there are indications of great pain, let a third be administered, which in some violent cases may be required, and even a repetition of it every hour till he shews signs of recovery, which will be the longer if he has not been attended to soon after the being seized, or according to the degree of violence of the attack,

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When composed and free from pain, as in an hour or two after the attack, two or three quarts of blood taken from the jugular or neck vein will be serviceable in subduing any rising inflammation of the intestines; and if he feeds, which on recovery they are apt to do, a little warm water should be given him to drink, and his food be warm bran-mashes, and good meadow hay only, for the next twenty-four hours, especially if the case has been very violent.

The undersigned Gentlemen have given their testimony of the Efficacy of this Medicine for the Gripes.

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JOHN PAYTON.

April 15, 1814.

ERRATA,

P. 8. l. 2. hatsful, read hatfulls, improperly altered by the printer.

P. 19. l. 1. more a, read a more.

HIPPIATRIA;

OR,

THE SURGERY AND MEDICINE OF HORSES.

BY BRACY CLARK, F.L.S.

*Member of the Royal Institute of France, and Ecole Royale de Medicine, of the
Copenhagen, Berlin, Stutgard and Frankfort Royal Agricultural
Societies, &c.*

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As the anatomy of the Horse should ever form the first class of Horse-knowledge, under the title *Hippotomia*; so the second class will be the whole *therapeutic*, or *healing art* of this animal, making a very large and comprehensive class, to which we give the title of *Hippiatria*; and which we divide, for greater convenience of handling, into five orders, as follows, viz.—

HIPPOCHIRURGIA; or, the Surgery of Horses.

HIPPONOSOLOGIA; or, the Diseases of Horses; their Symptoms, and Treatment.

HIPPOPHARMACOPOIEA; consisting of the Medicines used, and their proper combinations. To which we add the

HIPPOCOMIA; treating of the Dieting of the horse, and of any medicaments used to promote his good appearance, or condition, as 'tis called, and to this we may add the

HIPPIATRIA MISCELLANEA; for the entering all matters not properly referable to any of the above divisions, as Mechanical Apparatus of all kinds; Galvanics, if such be used; Natural History of the Horse; his General History; Litigation also, arising from Morbid Affections; and all the other auxiliaries appertaining to Horse Medicine and Surgery; thus constituting something of a System in these affairs.

INTRODUCTION.

HAVING formerly in Dr. Rees's Cyclopædia given a brief sketch of several parts of the Equine anatomy, of those parts more especially of this noble animal which required it, as differing the most widely from those of the human, to which more ample details were afterwards added respecting that important part, the foot of the horse, and of his shoeing, exhibiting for the first time its dire and hitherto mysterious evils. We afterwards took up the pharmaceutic department, and hope and trust we have left useful matter for the Veterinarian in that publication: also a General History of horse knowledge, and some parts of the natural history of this precious animal. We are now venturing not without apprehensions, upon the departments of the medicine and surgery of this noble slave, from a pretty extensive period of experience and labor upon it, which has been mercifully permitted us; and after a few general prefatory strictures, or remarks, we shall pursue this elucidation in a simple alphabetic order, as being the most easy for reference of any, to the practitioner.

It may not however be without its use in the first place, just to explain the meaning of the terms above employed for divisions, as all practising these arts are not alike versed in the Greek and Latin languages, and to whom therefore it may not be unacceptable. Such terms are ever useful, indeed necessary, as saving much circumlocution and affording more precise boundary lines than long definitions, and in facilitating also the writing, thinking, and even reasoning, upon these subjects.

The word *Hippiatria* is derived from the Greek *hippos*, a horse, and *iátrós*, a physician, forming together a term that was much wanted in our art, since the word *Farriery* usually employed for it, has in reality no relation whatever to medicine or surgery, referring only to the shoeing department, being derived from the Latin *Ferrum*, iron. *Hippotomia* is from *hippos*, a horse, and *tomo*, to cut. *Hippochirurgia*, from *hippos*, a horse, *keir*, the hand, and *urgos*, work; signifying, bone-setting, and sawing, and other operations of the hands, the very mechanical part of surgery, in which, though adroitness be a very commendable thing, it is an inferior quality to that of a solid judgment in the knowledge of the powers and wonderful resources of nature, in performing cures, without our too officiously resorting to operations, especially painful ones, or any such undertaken from unworthy motives. *Hipponosologia*, from *nosos*, a disease, and *logos*, a discourse. *Hippocomia*, is from *hippos*, a horse, and *komoo*, to adorn, or to ornament, and hence perhaps our word *comely*, also I hardly doubt if the familiar word *comb*, may not have had its origin in some way, from the same root.

In entering on a work of horse-surgery one should be failing in our moral duties not to recommend earnestly the employment towards these worthy slaves of the utmost kindness and humanity, which their merits certainly entitle them to, and not to let them be exposed, to any wanton suffering or infliction; remembering that they are defenceless, therefore claiming our best protection, and to him who is merciful, mercy will be meted out in the day of awful account. The truly enlightened and intelligent veterinarian also will not take up the profession solely and wholly to make all the money he can by it, but to do all the good that lies in his power, in relieving their wants and necessities, and in saving them from any unnecessary abuse and persecution, too readily dealt out by the mercenary and the interested. At the same time, by intelligence in his profession, he can teach the public how to secure their efforts and make the most of their services without loss or injury to their owners or themselves, and in what consists their truest interests in their use.

By many it was hoped, and it might certainly very reasonably be expected, that the establishment of a Veterinary College in this kingdom, by taking the affairs of the horses very much out of the hands of the common Smiths, and Farriers, would ensure a more enlightened, and a more humane treatment of the animal, almost as a natural consequence, but alas! we are obliged to confess that, at the present, no such effects have been produced by it, but that operations as they are called, upon them, under one pretence or other, have increased in a tenfold ratio, and such scenes of cruelty have been perpetrated as would make a man shudder.

INTRODUCTION.

It may perhaps afford some extenuation of such conduct, and that it does not wholly proceed from cruelty, and a desire to get money at the expence of their feelings, that it is almost ever the case that in passing from a course of vulgar routine, or ignorant empiricism, to one founded on really scientific rules, and principles, blunders will be committed, and let us charitably hope they may have proceeded from this state of transition, at any rate such is their best apology. An enumeration of a few of these errors may not be without its use in preventing a repetition, or revival of them when the present period may have passed away, and been forgotten.

The first error these reformers of the college fell into, and were most deeply embogged in, was the doctrine of frog-pressure, first introduced from France by St. Bel, but who was, from past experience perhaps in France, more cautiously occupied with it, but which was taken up by his successor with headlong devotion. The mistake consisted in supposing the horse's furch, or frog, as they called it, was intended by nature as a kind of bolt or wedge to force the inflexions, or heels asunder, and sometimes that it acted the part of a plough, in driving into the ground, and stopping the horse! This delusion was worked upon with blind pertinacity for the space of thirty years, or more, although for the last two thirds of that time, the clearest evidence of the folly and falsity of such doctrine existed in full radiance before the eyes of the blind zealot, but alas, to no purpose! the idea was clever, and abstracted and it therefore must be right, said they. Horses innumerable got punished and thump't upon their tender frogs, some by hard iron bars attached to the shoe, and some by having their inflexural columns removed and lowered, to bring this part in contact with the road, which it was rarely or never meant to touch, of such inflexible materials is a College.* The falsity of the system now almost every tyro in the art understands, which was for so long a period incomprehensible to the professor, and in his liarangue to his pupils any allusion to it now only serves to excite a smile. But what recompence can he make to the poor creatures, for the tortures he thus inflicted upon them, in this obstinate manner, when evidence clear as daylight existed of its absurdity? and every experiment of his own must have evinced it. What recompence can he make to the youths thus deluded, and who lost their professional reputation, and business perhaps, by following such an infatuation? or, what benefit have they awarded to him who first discovered the cheat?

One other abuse of the art, we would wish now to speak of and repudiate, which, although not proceeding directly from the college, is proceeding from one of its favourite emissaries, and has not met with its veto: and that is the unspeakable abomination of firing through the skin of horses' legs. It always appeared to me revolting enough, after an animal had lent us his assistance and had done his best, and beyond what ought to have been required of him, both for his own sake and his owners, for he had injured himself thereby, instead of receiving rewards and caresses for such meritorious exertions, which had, it is to be hoped, benefited his owner also, he should receive instead of kindly treatment the glowing favour of a red hot iron, applied to the sensible skin of his legs: and our debutant of the college, not content with a light firing, has proposed the above horror. For my part, I always thought a light firing the best, and so did M. Crepin, one of the best veterinarians in Paris, with whom I conversed on this subject when in that metropolis, and can only compare such an abominable proposition to the killing the goose that is to lay the golden eggs.

* It is truly curious to observe the vast deference that is often shown to a place so designated, a sort of blind reverence that is unaccountable, or as though there was something superhuman about a college, although the word has its sole source from the simple Latin verb *colligo*, to collect; meaning therefore, nothing more than a collection, and such may be good, bad, or indifferent, as it happened, and nothing demanding such an implicit acquiescence. It is lamentable however, to see, that corporate bodies having vested interests ingrafted in this way, dare to perpetrate iniquities that no individual dare attempt, suppressing often that very knowledge which they were bound in duty to foster and encourage, but which they keep out of sight for fear of laying open some interested corruption, or some glaring ignorance, deficiency, or inconsistency, of their own.

Legs most hideously enlarged, have we seen from this scandalous practice, with imminent peril of a general sloughing of the skin; and one instance of a fatal issue has come to our certain knowledge from this frightful method of firing. We consider it a paragon of folly as an operation for producing beneficial effects, and as surpassing in cruelty all the operations in use with the unwashed, unreformed school, of the old farriers. A stroke of the red hot iron we should suppose about equal to the cutting of twenty knives, in stripes of the same length, that it may be imagined a little what the animal has to suffer from some scores of these lines, when inflicted in the cool, deliberate manner, we have at times seen it done, by one of the reformed school, to evince to the bystanders his complete self-possession, in *doing* an operation. If a horse has been so damaged by his employer as to make it necessary to resort to such measures, surely it would be a hundred times more merciful to destroy him at once, than to torment him in this way. We here desist from further remark on this subject as there will be again occasion to advert to it in its place under the article, *Firing*.

There is still another piece of refined cruelty in the operation way, and proceeding from the College itself, that we feel bound to notice in the preamble to a work of this sort and this is, nerving, or rather, unnerving, the legs of horses, usually adopted for lamenesses of the feet. Where the sagacity of the reformed school is unable to discern the cause of a horse's going lame, for instance in cases of contracted feet, the common and most frequent source of lameness among horses, it is a ready means of getting rid of the question to pronounce it a case of founder, and then to propose a severing of the nerves, going to the part, and proclaiming it, "a brilliant discovery," and from the frequency of contracted feet, they would not fail of having plenty of such cases to reward the operator. Now if this most *exquisite* operation, for cutting of nerves is an exquisite affair, was really performed in a *bonâ fide* manner, upon the principal, or main nerves of the limb, the animal went stumping about, for it could hardly be called going, till his hoofs came off, and sometimes, as we ourselves saw examples of, the accident happened whilst the horse was in the middle of the road performing his work, at other times the separation was first detected while standing in the stable, by the finger of the groom, and such was inevitably leading to the destruction of the animal, since a succedaneous hoof is well known to be of little, or no use. This dread catastrophe it would appear, results from a want of due nutrition to the hoof, and the other parts concerned, as arteries, when deprived of their accompanying nerves, do not act with the same energy as when these are present, and further that, by the removal of these faithful watch-dogs, which are bestowed to give timely notice of any part not being in a state fit for service, that such in proper time may be desisted from; for, a part that is not in a condition for use, being used, some derangement or dismemberment, will be the consequence. Finding these calamitous results, they became pretty quickly more cautious, and wary, and took to partially, or only half nerving, snipping only twigs and branches of nerves, but as such did not always remove the sensation of lameness, and occasioned demurrings, and unsatisfactory results, so the rage for this wholesale proceeding, then begun to experience some degree of remission. However, *malgré tout cela*, an operation was much too good a thing to be given up, and abandoned, which afforded such opportunity of surgical displays, and of profit too, so that it became less cautiously exhibited in the skirts of the town, and in the country, in the former we knew those who made it a boast of the numbers they had so served, and had *hopperated* upon, and of the astonishing quickness with which they did the same, and the great traffic they had made in carrying on the game. At length however, they began to discover, and the public also began to assist them a little in this knowledge, that these cases of founder were only mere cases of contraction, and that by a proper attention to the shoeing these might be relieved, by giving the foot a little more liberty upon the expansive principle, and this they then added to their operation, but took good care to ascribe all the good, to the operation only, and nothing to the shoeing; in this way a slight

scratch or two and a little blood issuing, was found would do as well in some cases, in securing the bonus, as the real operation, and at length we hear but little of this nerving, and as the expansion principle becomes more and more practised, and understood, we shall hear still less and less of it. My friend Moorcroft indeed first raised the suggestion of nerving, but from humane motives, and from fearing the abuses of it in vulgar hands, kept it very much to himself.

In an introduction to the surgery of horses, it is proper that any surreptitious practices, and abuses, so easily fallen into, should be exposed, as much for the honour of the profession, as out of regard to the animals themselves. We shall therefore notice in this place another pruriency of the reformed college, which appears to deserve some little attention, if not castigation, not at all fearing to lose by it, the support and patronage of a college, or indeed of a profession, we never, except in a very few instances indeed, cordially obtained, although always endeavouring by the most earnest means to merit it, and by our researches to promote and deserve it. We shall not now therefore at the eleventh hour on that account withhold anything which we think may be of benefit to the animals, or may render the future profession more intelligent, more useful, or more humane.

The practice lately fallen upon, and which we have above alluded to is, that of running setons through the horse's furches, or frogs, as they are called, under pretence of discovering a disease which can in reality only be known by dissection after death, the interest concerned in so doing the reader will readily divine without its being particularly mentioned by name.

The facts of the case appear to be these, that there is undoubtedly occasionally found in shod feet an ulceration, or erosion, of the *shuttle*, or *nut-bone*, (*os nuciforme*,) which bone is placed across the foot, immediately behind or at the back, of the coffin-bone. It has appeared to us not improbable, that this disease may have had its origin, or been occasioned, by an undue pressure upwards of the horn-sole, and all the lower parts of the foot, from the too violent nailing on, of the shoe, and in some cases, more especially where a lowness of the bones of the foot from natural structure existed, or from the want of a sufficient mass of elastic material, between the horn-sole and this bone, or otherwise from an unusual elevation of the commissural ridges of the sole, or from one or all of these circumstances combined, an unusual pressure then upon this cross-disposed bone of the foot would take place, and at length an erosion, more or less extensive, of its inferior surface. Now this they have chosen to call the *Navicular Disease*, confounding thereby this bone, at least in name, with the *navicularis* bone of the human anatomy, to which in situation, appearance, or use, it has not the smallest affinity, thereby creating much confusion, and obscurity. Moorcroft appears to have been the first to notice such an erosion, but did not conjecture its cause, and indeed so very rare is it, that in fifty years' close application to the feet of horses, and very frequent dissections of them, which those perhaps who have witnessed, and read my labours and discoveries therein, will give me credit for, I never met with but a single, solitary case of this disease, which I figured, and gave an account of, in an extra, or supplementary plate, with other matters, adding it to the eleven plates I had previously given in that work on the foot. Others I know have collected together numerous bones of this kind, ulcered and eroded, but many of them obviously, had been the results of kernel-nail cases, or cases of canker, which should not have been at all confounded with it; or it may be that this disease may also have its source from the long continued constraining exertion necessary in going on the toe, as where the heels had become tender from a contraction of the whole foot, the usual effect of common shoeing, or from other bad practices, aided perhaps also by the presence of, and tenderness from, running frushes.

Now the discovery of this rare disease has been made quite a mare's-nest of, with some of this profession, who have also turned it to good account, and if any case of lameness presented, that was a little obscure, and of such there will be always plenty, it was immediately declared to be, a *Navicular*! And what might the reader

imagine was then the remedy proposed, why an operation of course, and no other than that of casting down the poor horse, always attended with affright and terror, almost as bad as the operation, and running a knife through his furch or frog, as it is foolishly called, a part wholly unfitted by its texture and construction for any such operation, and at too great a distance from the nut-bone, the seat of the disease, to do any real good. In passing the blade through, he first had to encounter the whole thickness of the horn of the part, of little use truly, in procuring a suppuration from, he next transfixes the cartilaginous capsule lining the horny cavity of the furch, and he then drives it through the cartilaginous, constricted layers, extending across the cavity of this lining capsule, and finally and lastly through the intervening pulpy gelatinous membranes which are interposed between these layers, precious materials all, truly, for obtaining a suppuration from, and how such suppuration when obtained, was to heal an ulcer situated at the distance of the shuttle-bone, with all the various matters interposed between these two parts, is no easy matter to explain.

Where such an ulcer, from any circumstances attending the case, might fairly be supposed to exist, the remedy to be adopted, as we believe, should be, at least as it at present appears to us, is to insist upon a total remission of the original cause of the evil viz. the nail shoeing; and next, to order a prolonged run at grass, without shoes, where the cooling sod to the foot itself, and the refreshing herbage to the body, or system, would generally after a time, it is probable, bring back the suffering parts, to their pristine tone, and condition, and then would take place, the healing of the sore. But if of necessity the horse could not be spared from his work, the working of him as moderately as possible, without shoes, or with shoes only lightly applied, and upon the expansion system, or with tips, or a paratrite, such would enable him to perform as much as an injured subject of this kind ought to be expected to give. In short, he ought to be treated in all respects, we apprehend, as for a general contraction of the whole foot from shoeing, as we can never get at the ulcer itself.

Now there are many in this profession no doubt, who intend honourably, and well, and men also of humanity, but such is not always the case in the motley groups who go up to pay their twenty guineas to get a sanction from the college for all this sort of practice, we are therefore desirous to warn the public against this intolerable passion so many are found to have, for resorting to operations, some to exhibit their coolness and surgical skill, and others for ends we need only allude to, without particularly naming. And further to augment this frightful propensity, there has lately an Italian veterinarian, come over to this country, recommending various absurd operations upon the round bone of the poor horse, in cases of lameness behind, on pretences the most absurd, and with a most revolting cruelty, reviving to the letter the tricks that used to be played formerly, by the old farriers with this part, a part so truly strong by nature, as hardly ever liable to be out of order.

An account of this Italian's most wise, and most merciful suggestions, duly displayed, may be seen in the veterinary periodical of the day.

In human surgery the practice is not half so sanguinary as formerly; nor are half the operations now performed that used to be eagerly resorted to. A slight depression of the cranium was enough for the surgeon formerly to fetch out his trephine, and bore through the skull of the poor patient; now it is found nature can remove in most cases such an inconvenience, without any other aid than keeping the system right. The painful operation of cutting for the stone now is nearly superseded by the crushing instruments; heavy splints for broken bones are much abandoned for the simple compress and cushion, and every progressive step in the art, leads into a more easy, less painful, and more simple treatment, for nature it is true must ever perform the cure at last. In confirmation of this remark, a very eminent surgeon, Sir Benjamin Brodie, has the following remarkable passage. "In a table I constructed of cases, it was curious to observe how large a proportion of the recoveries occurred in those cases in which the surgeon avoided an operation altogether, or confined himself to the removing of some loose, or detached pieces of bone; a person who has a musket ball lodged in

the brain is in a very dangerous condition, nevertheless it appears to be safer to allow it to remain, than to endeavour to extract it." *v. Introd. Discourse*, p. 19. And I know also by long experience, from an extensive business among horses, having myself attended for years, some of the largest breweries and horse concerns, of the metropolis, that such may be done without much casting down, of the horses, and that such I can say is not by any means frequently necessary. Simplicity again may be carried too far, and I am convinced that I have seen in Paris amputated stumps treated with simple lint, or lint dipped in water, that have mortified, and great numbers there do so, and which a little of our warm digestive, of rosin softened with oil, would we believe have certainly brought to a healthy suppuration, and to a sound healing. So that it is obvious we may err on either hand.

There is one comforting reflection however, amidst all this, which has attended the attempt at reform in these arts in this country, and that is, that the horse's ears, and their tails, are now left more at their ease, and free from amputation, and the practice of nicking, and of docking, we hear but little of comparatively at present. A practice however has sprung up of late of shearing the horses of their coats, or of clipping them close as it is called; how this fashion originated, or with whom, I know not, but believe it to be a very absurd one, and would not be much practised, did there not a small gratuity, or *douceur*, attend the doing of it, and if there were no scissor-makers to recommend it. That it makes horses go better, and that it will cure a cough, I have heard some say, but what will not interest, and fashion, make people assert in aid of her practices? I am myself no believer in such doctrines. A fatal case has just come to my knowledge of a beautiful and most valuable Norway horse, by inflammation of the lungs, immediately consequent to a clipping operation of this sort. Like the hateful list of Banquo's Progeny, "*another and another comes, and the last fool was welcome as the first.*" The sub-professor to his former unlucky attempts has lately proposed yet another operation, that of pricking, and digging, through the skins of horses' legs down to the periosteum, by way of relieving them from spavins, splints, &c., one of these cases we hear, by extending the inflammation to the joint, terminated in a general ankylosis, as might be expected, this operation is called for brevity, the *periosteotomizing* operation.

Operations also on the genitals of the horse, of a most cruel description, under the pretence of calculi in the bladder, have been ostentatiously exhibited, and I believe if fairly investigated will be found to have no real grounds for them, that can truly sustain, or justify, any such exhibitions as these.

Whilst upon these unpleasant, but very necessary topics, I may also just observe, that the profession would be much more useful, and respected, if its votaries were more select, instead of allowing the admission of all that please to offer themselves, with twenty guineas ready for the professor's opening palm; if some sort of previous examination was required, as to the extent of education, and degree of fitness, of the candidate, for becoming an authorised member of what ought to be, a *liberal profession*, and indeed such inquiry was actually enjoined by the original rules of this corrupted institution, but at present we do not hear of any being unfit who can only command the requisite fee, and the accumulation of such fees beyond a certain amount, ought we think to form a fund, for the various wants of the college itself, and for the encouragement of its more poor, or meritorious members, especially for paying the examination fee given to the human doctors that the professor appoints on these occasions, or for prizes given for good essays on the art, instead of its being a continual seduction for the admission of as numerous a host as possible of all sorts of characters. The income at present in this way is enormous, and for what!!! we observe also that the lowest characters are ever the most flexible, and readiest, to be supporters of its corruptions, and abuses, whenever the professor has occasion for their aid.

THE SURGERY OF HORSES.

Arteriotomia, Arteriotomy, or the opening and closing of arteries. The only large artery we are used at present to open in the horse is the *Temporal Artery*, more particularly useful in affections of the brain, which however in this animal generally arise from some disordered action of the bowels or stomach, where the chief attention should be directed; also in violent inflammations of the eyes. In respect to making the opening it may be well just to remark, that this as well as all other arteries are more difficult to arrest the bleeding of when partially divided, than when completely severed, since the divided ends or extremities can then more freely contract and arrest the effusion of blood, than in the former case, therefore in taking away blood from this large vessel, we have found it best to pass a sharp-pointed bistoury under or behind the vessel, and so near to the bone as in bringing it out completely to sever it, by which a sudden and copious flow of blood was obtained, and any danger from too great a flow was obviated.

By this proceeding however, the accompanying vein is usually divided along with it, and blood of both colours is seen to flow, and it will be observed that after a time, not very long generally, the blood will cease to flow by its clotting and coagulation, and plugging up of the vessel, and also perhaps from the ends of the vessels themselves contracting at the same time. We thus rapidly and fully effect the unloading of these vessels, and of all the adjacent parts, and of the system generally.

Of bleeding the Coronary Arteries, and Veins; which circulate upon the rounded summit of the foot beneath the skin and cutidura, spreading upon the cartilages. These may be usefully divided in injuries of the foot from sprains, wrenches, treads, or inflammatory affections, or arising from the shoeing by its compressive power, or from a too deep nailing. It is done by successive dips with a round-pointed lancet through the integuments, which should not be plunged in too deep as the vessels lie superficially chiefly, and are ramifying in reticulations, and endless anastomosings upon the surface of the cartilage. They are veins chiefly with numerous arborescent arteries coming through the cutidura for the secretion of the horn perhaps, and which are divided along with the veins. The bleeding ceases after a while of itself from coagulation in the orifices; neither have I seen injurious consequences ever result from this mode of depletion. If a more copious stream be thought advisable, it may be obtained by using the lateral edge of the lancet in longitudinal gashes on the part. And if the utmost local evacuation be required, the application of cloths wrung out of warm water will procure it.

On bleeding the Toe, or Pince Artery and Vein. In case of bruising, wrench, compression, or other inflammatory affection of the foot, these can be opened with good effect. For this purpose we thin away the horn of the sole extensively from its front part, by a small fine drawing knife, and when so thin as to be felt sharply by the animal, we plunge in the same sharp tool, or small drawing knife, (called a searcher by the smiths) and by dividing both artery, and vein, procure a copious discharge of blood. The blood flows freely from both vessels, and though the artery be divided, it in a general way stops after a time of itself, without any particular measure being resorted to for this purpose. It may perhaps admit of some doubt if after thinning the horn sufficiently, the lancet might not be employed, instead of the drawing knife, as being attended with less laceration of the parts, the flow of blood however would in this case probably be much less copious.

Complaints have been made by some that a festering of the sore has followed this operation, and such we believe can easily happen, but we do not remember however of any such instance in our own practice, and believe where it has occurred, that it has been from a neglect in not thinning away the horn sufficiently before making the opening of the vessels, and that the wound was not dressed as it ought to have been afterwards, with a mild resinous dressing, first on lint, and then with a pledget of tow deeply immersed in the same and laid upon it, and lightly packed in, but not forcibly rammed upon it, the resinous digestive should have a consistence of considerable tenacity that it might not so soon be lost by sinking away among the tow and dressings. The wound should also be inspected in a few days after, that if any hard, or impinging point of horn offend, which is known by a limpid oozing from the part, such should be thinned away and removed, when the healing will readily take place. It is in this case only the small circumferential artery and vein of the sole that is divided, the main artery being snugly enclosed within the solid body of the coffin-bone, encased most curiously in its semicircular recess, and is from thence sending forth by numerous ramifications the blood to the outside of the bone and to the reticulum and the podophylla, &c.

This singular feature in the circulation of the blood in the horse's foot being completely new to us, we give a woodcut of it, see fig. 1. A triangular piece of the bone being removed presents a view of this remarkable cavity, which on the vessels being drawn out affords on its receding surface eight or ten, or more openings, which are found, using a thin wire for the purpose, to communicate with all the exterior apertures of the bone, especially those larger and oblong ones which are situated near its lower edge. The roofing of this cavity, see fig. 2, presents also the two oblong foramina, which are conveying the arteries into this cavity from the back of the bone, and between which openings is visible a large cell that appears to act as an air vessel upon the circulating apparatus, and on minutely inspecting it, we see this deep cell is formed at the bottom of various oblique ribs, and threads of bone, placed at acute angles to each other, and having in the intermediate spaces numerous small and hardly visible openings, which again are found to supply the upper parts of this bone, and its coverings probably, with blood, making altogether perhaps more than twenty vessels, and which together appear to form a radiating centre, from which proceeds the chief arterial circulation of these parts. As this singular part does not appear to have been before intelligibly described, figured, or named, we shall call it *the Cavitas Semilunaris*, and hope it may prove an acceptable acquisition to our knowledge in these arts. It will also be pretty obvious, that the two currents of blood in the two arteries meeting in this recess, by opposing each other, will render the circulation more slow; also the arteries proceeding from them at right angles will further contribute to break a too rapid



course of the blood in the foot, and to render it, even under strong exertion, more uniform.

On Closing Arteries, or other large vessels that refuse to stop bleeding, compression is the usual means resorted to, or the severing of the vessel, as we have above noticed in respect to the temporal artery; if these avail not, a ligature is passed round the vessel by a curved needle, observing to tie the extremity of the vessel next the heart in arteries, and the contrary extremity in veins, or both if requisite. Torsion has also been recommended by some, but is not at present greatly approved of by our English surgeons, and my friend Sir Anthony Carlisle has an ingenious method of stopping the effusion of blood in a different way, by employing a solid iron cylinder of about the size of the forefinger, and of about half an inch in length, attached to a thin iron rod or wire, for a handle; by immersing this solid cylinder of metal in boiling water, a certain degree of heat only, is soon acquired, and which is sufficient if held to the part, to coagulate the blood, and to form a plug in the orifice of the vessel, adequate to the arrest of any further effusion, the coagulable lymph of the blood being rendered solid by a less heat than 212 degrees.

On Bleeding the Horse, Venesection. There is no operation the veterinarian will be called upon to perform so frequently as that of bleeding, it behoves him therefore and is of essential consequence to his practice, that he should be familiar with it, and perform it with address and dexterity. And be also well acquainted with the various accidents, and evil contingencies which may at times result from it, however carefully or skilfully, it may be performed.

Bleeding from the jugular vein in horses, is of all operations the most useful; for diminishing the general mass of blood in the system, and thus counteracting any local or general, inflammatory action—for destroying plethora or over-action of the heart and arteries—also for removing oppression from engorgement of vessels when it is suppressing their proper actions. As a general rule in doing it, it is to be observed, that the larger the orifice and the more copious and sudden the stream, the greater will be the effect upon the system, and that with the loss of a less quantity of blood, which in some cases of fevers liable to sudden collapse, and debility, is of the very greatest consequence, as being more easily recovered from, the effect being greater even than would be afforded by a larger evacuation taken away more slowly. *The Fleam* therefore we prefer in a general way to the lancet, in removing blood from the neck, as giving a more copious stream, and as being less liable, especially in common hands, who are often sent to do these operations, to abuse.

By pressing upon the vein below the point intended for the orifice, we swell the vein above, and enlarge it to a size that makes it no very difficult matter to strike it. The vein is however often not opened though a vigorous stroke has been given, and such formerly used very often to be the case, and arose not from missing the vein, but from the fleam being made with too slender and genteel a back, such being often put into a knife-handle, so that the prominent, rising muscles of the neck enclosing the vein receiving the impression of the stroke, the vein yielding before the instrument, was not opened, but now they are usually made otherwise, and with a very broad back.

It is usual to wet the hair over the part intended to be punctured with saliva, and then if these are drawn parallel to the direction of the vein, the lancet passing between them, there is less resistance than if they presented transversely to the blade, in which case they must necessarily be divided before the incision could take place. It is however true, that very much wetting the vein outside may occasion the jet of the blood rather to take the direction of the neck and not deliver well, that this should be also attended to.

In timid, shy, and suspicious subjects, as in some kinds of blood-horses more particularly, we have sometimes tied a common bottle-cork in a string, and pressed it upon the vein, then passing the string round the neck, we set the hands more at liberty for the use of the fleam, or lancet, which in delicate or timid subjects is best used, held short between the thumb and forefinger, and so managed as to go only to the prescribed depth. An abscess lancet is the best for this purpose, but not too large however, or very long in the point, as it may pass through the vein on the opposite side.

The proper Recipient for the blood in these cases of jugular-vein bleeding, appears to be a light *Tin* or *Zinc Can* holding about a gallon, or rather more, and graduated inside or out, or both, in pints. The handle of it may project from the side in such a way as conveniently to be made to press upon the vein below the orifice, thereby facilitating the bleeding, or which is better, a globular or hemispherical hollow boss, or ball of tin, may be placed on the side for this purpose, instead of violently as is now usually done, pressing the edge of a stable-bucket against the vein, which can be only applied in a very partial manner, on account of the projecting muscles of the neck.

To execute this manipulation conveniently and satisfactorily, two things are requisite, good tools and keeping them in perfect order, ever ready at a moment's notice; a commodious apparatus for this purpose is the following: an oblong square piece of morocco or other leather, ample enough to turn down on the sides, to cover the following instruments, confined by a strap running down its middle, viz. a large and smaller fleam, an abscess lancet, a smaller one for bleeding the eyes, a pair of wire-nippers, a small pocket or pouch at the end, for a lock of long fine tow, and a floating leaf of kerseymer for the insertion of pins, &c. will furnish all perhaps that is actually and indispensibly necessary, and being wrapped in the leather will occupy the smallest possible space in the pocket.

A Fleam is often made with a spring, commodiously to plunge it suddenly into the vein, being less alarming than the employment of the hand and of the blood-stick. The objection to them is, that the instrument from being pressed firmly against the neck in using it, cannot be so suddenly withdrawn as might be desirable, and we have seen the horse plunge immediately on receiving the stroke, and the projected blade has ripped up the neck to a considerable extent. To prevent such an accident another spring let loose by the stroke might bring back the fleam again within its frame or case, by which such an accident would be obviated.

Ulceration of the Jugular Vein. Bleeding the horse's neck-vein is certainly not a very difficult, or hazardous manipulation—considerable care, and attention are however requisite afterwards, to ward off evils which in various ways are attached to this operation, and in this particular case most true is the maxim, that prevention is better than cure, and a slight attention may remove very serious troubles. For this immense vein is very liable to subsequent inflammation and ulceration of its cavity, extending often in one or both directions, along its internal surface, obliterating the cavity of the vein itself, and often going on in a backward course, till it reaches the head, and causes the destruction of the animal. Immense thickenings of the surrounding cellular membrane generally attend this lesion of the vein, forming abscesses into which the blood often finds its way, and becomes very troublesome, and which, continuing on in succession, at last reach the head, when death ensues. To avoid therefore so calamitous an event, it will be well to observe the following attentions: To use a clean, sharp, smooth instrument; not to strike the vein where

it has been often opened before, and has become enlarged, thin, and bladder-like, but rather to go above or below such part; in pinning up not to include more than the skin. Nor to leave the pin of its full length, as being liable to catch objects and getting entangled, tear out the piece, and rend open the cicatrix; a pair of wire worker's nippers are the best for this purpose. The pin also should not be allowed to remain in the neck too long, in a general way perhaps twenty-four hours is sufficient, but where the horse is very full of blood and the orifice has been large, and has bled freely, eight and forty hours will not be too much, and not whole days or weeks as we have often seen it negligently left. For the wound in drying and cicatrizing with the pin left in, is apt to become itchy, which may induce a rubbing upon the mangle, that may be attended with injurious consequences. Now the pinning of the neck is sometimes, with high fed and skittish subjects, a troublesome affair, more so than the bleeding; in some cases therefore, where it is likely to be so, pressing the lips of the wound together between the thumb and finger, holding it a short time, and then tying up the horse's head to the rack, or to the heel-posts, and to let him so remain an hour or two, till the desiccation of the blood shall confirm the union, and render the pinning unnecessary. Also to avoid pinning, where the bleeding has been very free or profuse and the orifice large, it may be better to place a bit of dry lint upon the closed vein, holding it awhile, and then placing upon it a thick lock of tow, and with a ribbon or fillet carried round the neck, make it fast by passing it between the hairs of the mane for greater security. In removing these pledgets however, into which the blood may perhaps have extensively insinuated itself, and strongly glued them together, we should proceed cautiously, not to rip open the wound, leaving, if it seemed requisite, a small portion that immediately covered the orifice, to fall off of itself; also sometimes it may be better to use warm water to dissolve and relax the blood in such a case, but this should not be done coarsely so as to dissolve the cementing blood in the orifice itself, but be used short of this, as it may otherwise relax the tender cicatrix, and bond of union, and so renew the bleeding, which at this period is particularly to be deprecated. If any part of the dressing be left on the sore, the groom should have notice of it, and be warned in cleaning the neck to have respect to the part, and not tear it off, for it is better the part should go uncleaned for a few days than to run any risk of this sort. The wound also should not be left in a wet condition, as such may unglue and open the orifice again. By attentions like these we may perhaps almost entirely avoid any ill consequences from the performance of this very frequent and often most beneficial evacuation.

After trying many stratagems with these unfortunate cases of ulcerated and obliterated vein, such as poultices, cutting out the thickened parts, causticking, &c. we found at last, mildly blistering the skin over the part, as efficacious as any, very much assisting in the reduction of these tumours; though, we believe, measures more immediately efficacious than this will probably hereafter be discovered for these unfortunate cases. However, after the precautionary measures above urged to prevent them, much may also be done by attention to the evil in its early stages; for when the vein does not heal kindly, it is known by an oozing, or weeping of lymph from the part, which, if neglected, is sufficient of itself to prevent the drying and cicatrizing, or healing of the wound. It therefore behoves us now, without loss of time, to give it our best attention, and to destroy this first indication of so pernicious a mischief.

In order to divert or change the enfeebling and languid action going on in the surfaces of the sore, in a case of a neck lately bled by the groom, that I was called into of David Ricardo's, Esq. of a noble coach-horse that had been bought under my own inspection a few months before, and for the sum of two hundred guineas; I immediately touched the weeping, oozing sore, with lunar caustic, not violently however, or so as to force anything open that was already closed, but gently, doing it once or twice, and then to prevent this high-bred, high-fed, noble animal, from rubbing the part, which in all probability smarted pretty handsomely, against the manger, I ordered him to be turned round in his stall, and his head to be secured by the reins, *in medietate rebus*, between the two heelposts of the stall, and to remain in that attitude for two hours, by which time the smarting would have gone off, and the effects of adhesion in the surfaces of the wound be produced, that were sought for by these means, and then being set free, to be watched for another hour to see that he did not abuse his liberty. In this way in about a week, this unpromising case, having been twice or thrice gently touched with the caustic, healed, was dried up, and skinned over, and a very valuable horse probably saved from destruction.

The same measures were pursued with a cart-horse in Lambeth, a little before this, and with the same happy results, adding after the dressing a minute portion of lint to the wound, that it might, being light, stick in the wound, without any addition of plaster or bandage, thus assisting in drying the sore, which would materially facilitate the healing of it. And since then, in another case, I used the conglutinum, or strong solution of sulphat of zinc, and with the same success. Getting the wound to dry appears to be of the greatest consequence in assisting the cure.

It may be well just to remark, that where the jugular vein has been obliterated, the horse is, I apprehend, very much deteriorated in value thereby. A distiller's horse which I had cured of this injury was sent to grass at Peckham, and after being there about three weeks, word was brought me that he had suddenly dropped down dead; and there is little doubt, as the same thing has occurred in other cases, that it was from apoplexy, the blood not returning freely from the head on account of the obstructed vein, which caused the disaster, so that every exertion should be used to prevent, if possible, such a miserable conclusion by early care.

On Sudden Death from Bleeding, &c. Only two cases of horses dying immediately after being bled have come to my knowledge; in the one the artery appears to have been divided and was soon fatal; in the other, Nesbitt v. Kent, the vein would appear to have been cut through both sides, and the blood extravasating into the cellular membrane of the throat and larynx, the horse was rather killed by the choking than by the loss of blood. If a ligature had been placed on the vein above the orifice, and a free issue given to the extravasated blood, the horse might perhaps have been saved.

On Bleeding the Conjunctive Membrane of the Eye. Which consists in simply everting the lid, and scarifying it freely with the sharp point of the lancet. After this it has also been usual to bleed the angular vein, proceeding from the canthus of the eye, by an oblique incision through its coats. It sometimes yields a pretty abundant flow of blood with eminent advantage, at other times only suffering a few drops to escape. I need hardly add, that it is the inflammation of the organ itself that urges the performance of this operation. Blistering the cheek also we generally

add to it, and if the case is very violent, a copious bleeding from the neck also, and repetitions of it. Some persons in performing this bleeding of the eye pursue a ceremonious course of twitching the animal first, and putting him to a good deal of pain, which is for the most part superfluous, as by rubbing his face freely with the hand containing the lancet, the puncture can be made so suddenly, that it is done before he has time either to move or think of it, or make any defence, which mode we have nearly always pursued, and with perfect success.

The Venapalati, or Palate Veins, are conveniently situated for opening, by making a transverse incision upon the palate with a lancet. We have resorted to it in relaxation of the palate, termed the lamperis or lampas, perhaps from an imagined resemblance to a lighted lamp or lantern, the parts being dependant and red. Some say they have been deterred from this practice by the difficulty they have experienced in stopping the blood, and there may be difficulty in this respect in some cases. In the very few where we have performed it, we have not known any ill consequences result from it. It certainly makes an uncouth disagreeable appearance, and we are not assured of it having much useful effect.

On Bleeding from the Radial Vein, running down the inside of the fore-arm, which can also be opened, and was a very favourite proceeding of the old farriers, who declared every lameness they could not well understand was a shoulder lameness, and then this vein being nearest to the part was fixed upon for being opened. It appears also to be the corresponding vein to the vein of the human arm which the surgeons find most convenient to bleed from. It is however but ill placed in the horse for being opened, and has the serious disadvantage and objection of being much enveloped in the fascias and tendinous expansions of the part, therefore apt to swell and be troublesome afterwards. It is a vein also that does not usually yield any great quantity of blood, and therefore is at this time but seldom resorted to. It was called by the old French mareschaux *La Veine Plat*, or Vein of the flat, and also by our old practitioners the *Plate Vein*, no doubt from its occupying or being situated in the inside of the flat part of the leg, for we received at that period our farriery, and terms, very much from the continent, and especially the French. For affording a good local and much less general bleeding, it seems of too insignificant a character to deserve being further dwelt upon.

On Cupping the Horse. There appears no absolute necessity for denying to this animal, on account of his hairy skin, the advantage of this invaluable remedy, a little soap and a razor soon remove these hairs and then a fair surface presents. His skin though less vascular probably than the human, is more so than the ass's, and will yield blood sufficient to the scarificator. In peripneumony or in enteritis we may perhaps more especially avail ourselves of this aid, applied to the abdomen or thorax. I know not what difficulties may attend it, from my own experience, having never used it, but my friend John Field has employed it and speaks favourably of it. It may be used also in bruised parts enlarged and swollen in the upper muscular parts of the limbs, and whether on the cheeks or not I know not, in eye cases: I leave it therefore for future inquiry.

ON BLISTERING THE HORSE. A means much resorted to by the human Physician, and not less so the Veterinarian for the mitigation or removal of a variety of diseases, internal as well as external, relieving in both cases probably by its strong irritation and counterimpression upon the parts adjacent to the disease, thereby obstructing its progress and sometimes wholly removing it, and perhaps on the principle that two morbid actions cannot well, or only with difficulty, be maintained in the same system at one and the same time. On this account it is particularly useful in internal inflammatory diseases and affections of the viscera, and not less so in reducing morbid enlargements of bone or thickenings of tendons, ligaments, or periosteum, superseding with great advantage often the application of the actual cautery, and considering the great simplicity and nature of the remedy, in a way that is truly and really wonderful.

These beetles, (*Lytta vesicatoria*,) cluster I had almost said, in the trees they inhabit, contrary to the habits of most others of this race, at least they congregate in considerable numbers, and from which one would be almost led to imagine they were more expressly designed than other insects by their beneficent creator to do these invaluable offices for the human race, though I believe most other insects of this class would have much the same effects, and perhaps even ants and flies if dried and powdered. In my rambles in Switzerland about the year 1798, which I recur to with feelings of delight, I often met with this beautiful insect, in the woods and delicious valleys about Chavorney near Orbe, at the foot of the Jura, chiefly on the Privet bushes collected in considerable numbers feeding on the leaves, after getting used to them I could scent them at some distance and even before I got sight of them, from a certain musty smell not very unlike a neglected cupboard frequented by the mice.

These beetles, vulgarly called flies, and in the late human pharmacopoeias designated *meloe vesicatorius* of Linnæus, are now changed again to *lytta vesicatoria*, because Fabricius has thought proper to change the generic name, and the Dispensatory makers have followed him; it is however much to be regretted that officinal names should thus be subject to capricious changes of this sort, and these beetles having for a long time and not very improperly been called *Cantharides*, we shall continue that appellation in which there can be no misunderstanding or confusion. It is certain however the insect employed by the ancients under this name for this purpose, was not the same we now use, though of the same genus or natural tribe at least. This blistering quality is found by the chemists to reside in a peculiar native oil.

Perhaps the singular phenomena attending the operation of these flies on the human or brute skin have never been satisfactorily accounted for, that with so little comparative excitement, pain or disturbance, or indeed much increased heat of the part, they should excite the cutis in such a manner as to cause it to throw out a great abundance of lymph, and raise the cuticle entire from its surface, rendering visible an important part the keenest eye or finest dissection could hardly alone be able to exhibit. It would almost appear as though the exhaling mouths of the cuticle were stopped, and permitted not the excited lymph to escape through them, and thus caused this fine membrane to be raised in one entire piece to almost any extent. Violent mechanical friction however will do the same thing, and even hot water; still the essential oil of the cantharides without any heat or friction does in a singular manner operate the same effects. The pricking sensation which attends the

blister may be perhaps from the elevation of the cuticle, in its leaving the skin, to which it had strongly adhered.

The vesication of the horse's skin is attended with some rather remarkable circumstances, the effects of the cantharides being somewhat different from the human, a much less degree of intensity of their application will excite a blister in the horse than would be required for the human skin, arising apparently from a more acute sensibility in the skins of animals covered with hair, and which acuteness and susceptibility of feeling may have been given them perhaps by their beneficent creator in order to their better protection from the numerous host of their external enemies; whether the hair has anything to do with it, or that it is that the nervous distribution is different I know not, but so it appears; for the dog's or the horse's skin is most violently affected by the application of oil of Turpentine which a man may wash his hands and face in with impunity. This excitability of the skin among cattle keeps them in a perpetual state of apprehension and motion during summer from the teasing of flies, of the blood-sucking tribes, and also those that by depositing their eggs with them, not only agitate them by their present operations, but leave them also a resident permanent stimulus, which abiding in their stomachs, or under their skins, keeps up an almost perpetual irritation, and in hot weather a necessity for motion and excitement of some kind, which appears to be a salutary means of saving them from the effects of an idleness and inactivity which their stomachs when full, and the weather hot, would dispose them to give way to indulgence to their great injury by the invasion of diseases and of indigestions to which they are but too prone.

Now in regard to artificial stimuli, or irritants of the skin, if we were to notice them in the order of their effects, we should commence with the mildest as the *Fat oils*, and terminate with the *Red-hot iron*, or actual cautery, applied in lines more or less dense, and which, on account of its painful nature, ought not, we apprehend, to be resorted to, but in cases of extreme necessity, being but an unworthy return for injuries received in our service often, by a cruel and unnatural demand of labour and exertion.

From this excessive irritability or susceptibility of the skin of the horse, it is found that the *milder oils*, and even animal *fats*, will occasion an increased warmth in the surface to which it is applied; even *Hogs-lard*, or *Horse-oils*, will do this, as we have frequently noticed; also the *oil of olives*, and *linseed oil*, which afford an irritation of the mildest kind. If a more impressive excitement be thought requisite, it may be readily obtained by the addition of any of the vegetable essential oils, as the *Oil of origanum*, or the *Oil of turpentine*. Sometimes, for distinction, the old farriers used to call these applications *sweating oils*, adding, very often deceived by names, as another oil, the concentrated *oil of vitriol*, or *sulphuric acid*, which, when mixed with the former, produced a pungent unpleasant application, creating great heat in the part and much uneasiness, and often increasing the lameness it was meant to allay, for it was often injudiciously applied in recent strains and injuries, where already there was too much heat and inflammation going on in the part. No sweating however, we should apprehend, is ever produced by it, but an anomalous excitement of an unpleasant character, attended with a peculiar and disagreeable smell, given out apparently by the part so treated. Acids, particularly the mineral acids, do not appear to have any

proper vesicating properties, but attacks the skin as a corrodent or escharotic, acting destructively on the whole general structure of the part.

The unctuous oils can be easily rendered stimulant in different degrees by mixing with them, in various proportions, the hot essential oils of plants, as the oil of origanum, &c. and next to these, we pass on to the further exciting actions of the cantharides, for whilst naturalists are making their almost continual changes in the nomenclature of this department, and indeed in all others of natural history, it is not safe to use any other than the commonly understood officinal name.

In the application of these insects to the horse's skin, it is only necessary to mix them with almost any kind of oil as a vehicle, and if they are fresh, or have been well kept in the dry, their effect will be pretty constant; as however this part of the subject, that is, as to the arrangement and proportions to be observed, is the proper business of the *Pharmacopoeia*, we must therefore refer the reader to our labours on that head, where he will find three very useful *Formulae* given viz. *common blister*, *strong blister*, and *moist blister*. The latter we know not how better to express or name, though not exactly what we could wish, for we found in the course of various experiments on this subject, that the addition of a little rosin to the blister, dissolved previously in oil, caused the blisters or vesicles to vastly augment in size, and apparently by keeping the parts from getting too quickly dry. Vid. *Pharmacopoeia Equina*, 3rd Ed. p. 38.

It is usual however, in order to increase the action of the cantharides, and it may be sometimes to economise the use of them, to add oil of origanum, which serves also to afford an agreeable smell, which those who are accustomed to it expect to have in a stable where these processes are going on, or they perhaps are not so perfectly well satisfied with them. It may be also proper first to observe, that the hair of the part must be carefully removed previous to the application of the blister. It was very much the practice formerly for chemists, who love a compound, to add the *Gun Euphorbium* to the blister, and also many other articles. It is however, we believe, much better omitted, the cantharides and oils doing all that is intended, or indeed really required, for simplicity is always better than complexity, making results more certain, and in cases of failure, inferences of the cause not so difficult to be understood. In order to ascertain with more precision the real effect of this Euphorbium, we applied it with oil alone to the leg of a horse, and a dry, hot scab was the consequence, and but very little or no vesication, that we afterwards omitted it without any visible detriment to the effects of the blister, which acting well, there is a copious discharge of serum, of almost the thickness and consistence of honey, from the skin of the legs.

It is a common practice also with the farriers to mix *Corrosive Sublimate* with their blister, and where it may be desirable to destroy the skin this should be used, but not otherwise; for it is no vesicatory, but a most violent escharotic, soon destroying any living matter it comes in contact with; and we have seen, from the ignorant use of it, the most deplorable effects, bringing away extensive sloughings of the skin, and even penetrating to the parts beneath, and so injuring them as to render the horse for ever after unserviceable, and indeed made it necessary his being immediately destroyed.

There is one effect however produced by the cantharides on the skin of the horse, and which, as far as we know, has not met with much attention, and that is a prodigious general thickening of the

integuments, which sometimes does not subside for weeks, nay whole months have not been sufficient for its entire disappearance. A blister, therefore, not producing these effects, which are not constant however, would be a desirable thing in the Veterinary Pharmacopœia.

In this general notice respecting blistering, which we are now taking, it may not be out of place to notice another cutaneous irritant, *The Pyroligneous Acid*, or that empyreumatic acid obtained by the distillation of wood in close vessels, which proves a cutaneous irritant, or rather cleanser, of very valuable properties, especially in cases of rough, hardened skin, and in mangy horses, the skin being simply wetted with it, it slightly inflames it, and occasions it to peel off, bringing away with it any foulness that may be adhering, and greatly reducing the hardness of the skin. It may be perhaps also applied as an ointment mixed with lard. Great assiduity and perseverance however is often necessary where the disease through neglect has long time existed.

It may be excusable also to notice here another way of exciting the skin, which has been of late years very fashionable, though at the present we do not hear so very much of it, and that is what the French call the *mora*, a sort of Fungus prepared with nitre, &c. which is slowly burnt on the part, or otherwise of cotton dipped in spirit, which answers pretty much the same purpose. With our patients it is hardly likely it will ever be much resorted to, as the heated iron, or actual cautery, in various degrees of heat, will supply us with a less tedious substitute. We may also notice a suggestion of the ingenious Sir Anthony Carlisle, which may be of eminent service where the cantharides or other irritants cannot be obtained, which is to employ an iron of a proper figure for the part, heated in boiling water to 212 degrees, when it is applied to the skin, either naked or with thin linen interposed between; his communication on this subject may be seen in the *Lancet*, vol. xi. p. 315.

Also in this general view of the whole family of the *Skin-frets*, or *Cutaneous Irritants*, we believe we ought not to pass over entirely unnoticed those which nature herself seems to have provided, no doubt for very wise purposes. In this remark we allude externally to the flies, and to the cutaneous bots of domestic and wild animals, which live beneath their skins, in the grub or larva state, keeping up a continual irritation there, as in oxen and various other animals, tending to divert affections of the head, and perhaps bowels, and to keep them on the stir in warm weather, when too much disposed to be idle. The sheep are particularly wrought upon by them, being lodged in their noses and crustaceous sinuses of the face and throat, and so are the antelopes, deer, and other wild animals, intimating to us thereby, as it were, the great usefulness of such exciters. And again, from the skin we may go to the stomach-irritants, which we find acting as extensively, there being not less than four distinct species found within the horse's stomach alone, and as the lining of the stomach and the skin are one continuous surface, as it were, passing by the intermedium of the lips from one to the other, so by a continuous connexion, they are well known to be attended with sympathies in common, and acting therefore in concert for the general good. These, we believe, may be called into action, perhaps artificially, more extensively than they have ever yet been, and in the *Cuterebræ* and the *Æstri, Genera*, will be found objects not unworthy our research and attention. Perhaps, at a future day, the art of administering these stimuli may be known; at present, exposure in places where they most prevail seems to be the only practicable means of doing it.

BLINDNESS, *Ophthalmia*, a disease very frequently happening to horses. The eye of the horse is subject to various diseases which may occasion blindness, as the *cataract*, the *gutta serena*, the opacity of the cornea, or its coverings, &c.

The disorder however, generally inducing blindness among horses, is the *Cataract*, and the inflammation of the external parts of the globe of the eye, which precedes the obscuration of the crystalline, is usually termed blindness, as though the disease was really confirmed, so that horses so effected are considered as such, and denominated blind, though at this period of the disease the sight is only rendered imperfect, or with a prospect of it.

This destructive disorder in general commences with an inflammation of the outer coats of the eye, as the *membrana conjunctiva*, or *cornea*, or both together, and extending gradually to the interior, inflames and destroys the transparency of the crystalline, and obstructs the admission of light, producing blindness.

These attacks of inflammation not unfrequently disappear for a time, or, at least, become much less distinguishable, and then return again, observing something like regular periods of accession and remission; and from hence the disease has been termed by some the *moon blindness*, and these changes were considered as under the influence of this planet, and corresponding with the periods of its change; there are, however, other causes more powerful in their influence, to which these changes in this disorder may, with more appearance of truth, be attributed, as improper exposure to excessive cold, drafts of air, a close, low, overheated stable, or sudden alternations from the one to the other; violent exercise and sweating, then washing with cold water, leaving the hair drenched with it; acrid volatile salts rising from the dung; over-feeding with too hot, dry, and stimulating food, and all other causes, which inducing an increased action of the heart and arteries, naturally tend to induce a recurrence of this complaint.

As this disease is one of the most interesting in the veterinary art, and the most necessary to be well understood, as well by professional men, as by dealers and possessors of horses, we shall describe at some length the appearances by which it is known to exist, and the means that have hitherto been employed, as far as they have come to our knowledge, for the removal of it. Those who may desire to be acquainted respecting the information possessed by the ancients of this complaint, and their practices for its cure, may be referred to the writings of Absyrtus and Vegetius: the latter, in his elegant work, *de arte Veterinaria*, lib. 2. cap. xvi. *de suffusione oculorum*, has divided this disorder into three kinds, under the titles *stenochorisis*, *protophorisis*, *hypochorisis*; by his definitions, however, of these three kinds, it appears that he only meant the different stages of the formation of the cataract, from the first inflammation of the eye, to the crystalline becoming perfectly opaque and bursting its capsule, rushing to the anterior chamber of the eye, and resting like a white opaque ball, against the cornea, occasioning a total loss of sight, and which he compares to the yolk of an egg bursting from its situation in the centre of the egg, and to which it can never again be reduced. He considers the cause of this complaint to be the rupture of the membrane containing the sight, by excessive heat, or more certainly from the fatigue of a long journey, or the neglected injury of the eye, from the inattention of the master. His *hypochorisis*, which appears to be the first stage of this disorder, he says, descends from the

head, and often shows itself in one eye, and then migrates to the other, and is attended by a flow of water or tears. His treatment is to bleed often from the eye-lids and from the temples; to foment frequently with warm water in which rue and fennel seeds have been boiled; to anoint the eye "*cùm collyrio et opobalsamato*"—remedies we hardly know at this day. He also recommends the actual cautery to be applied to the temples above the veins. This author in another chapter recommends in this complaint, that you should inspect the nostril on the same side with the morbid eye, and you will find a small opening, through which, by inserting a pipe, you may fill the eye with wine and relieve the disorder; a remarkable proof of the minute and accurate observation of these ancients. The existence of such an opening (for it is in reality, the opening of the lacrymal duct that is alluded to), is not known to many who profess to practice on the diseases of horses at this day.

Absyrus, a Greek writer, who lived about the reign of Constantine the Great, and prior to Vegetius, recommends in this disorder, and which he calls *ναλωμα*, that the ear should be pierced with an awl, and a piece of white hellebore should be inserted in the perforation for relief. At this day the ears of milliners' girls and apprentices are pierced to improve their sight and render them capable of small work.

The following we venture to give as a more natural and true description of the appearance of the eye, during the presence of this complaint, than has before been exhibited; though, no doubt, subject to many omissions and imperfections, which future observation may lead to the rectification of.

The earliest indication of this disease is exhibited by the external transparent parts of the ball of the eye becoming obscured, assuming a blackish glassy hue, sometimes blue or brown, or a dull opaque white, and streaked with blood, according to the degree of the inflammation or the distension of the blood-vessels, admitting, according to their capacity, the different parts of the blood which are not transparent; and this inflammation, it may be remarked, takes place more frequently in young horses of five or six years old, than in those of a more advanced age, and the upper half of the *cornea* generally appears more obscured than the lower; this however may be a deception, arising merely from the point of vision, the observer being placed below the eye, and seeing directly through the lower part, but more obliquely through the upper. The blood-vessels also may be observed increased in number and size, passing over the opaque white surface of the sclerotica in order to go to the *cornea* and *conjunctiva*; for it has not, as far as we know, been ever ascertained from actual dissection or experiment, whether it is the cornea that is inflamed, or the conjunctiva, or both; nor is it absolutely necessary for the treatment, that this should be actually ascertained.

The eye and eye-lids feel hotter to the hand than usual; and often times there is a deposit of a white matter resembling pus, in the bottom of the anterior chamber of the eye, and which, perhaps, proceeds from the vessels of the ciliary fringe, or uvea, which are particularly large in the horse depositing it.

After this opacity of the coats of the eye has existed some time, the eye of itself, or still more certainly if antiphlogistic means have been used, returns to its natural brilliancy, and the disorder seems

removed; and a few weeks or months may elapse before its return; and if proper remedies are had recourse to very early, the disorder may be often permanently removed; it very frequently however does return, and again disappears, and this several times before the inflammation of the crystalline, and the destruction of sight takes place. In other subjects, one uninterrupted course of inflammation, without any interval, takes place, till the cataract or opaque crystalline is fully formed.

When this morbid process begins in the crystalline, the inflammation of the exterior parts of the eye often disappears, and they assume their usual brightness and transparency, which affords us an opportunity of distinctly observing the changes which take place in the lens.

And, with respect to the cataract itself, or the opacity of the lens we may remark, that the whole crystalline shall assume a milky appearance at once, or a small speck only near the centre shall be seen, which often remains for years, without the least perceivable increase, and without producing blindness, or any sensible detriment to the animal: in other cases, no speck is observable but whitish lines which reflect the light, stretching like rays from the centre of the lens to its circumference; and sometimes the capsule containing it, is said to be only affected.

The cataract, as it is called, being fully formed, the complete opacity of the lens being established, and the light being no longer admitted, the iris begins to lose its properties, nearly closing up the opening of the pupil, from its relaxation, and the whole eye becomes diminished, and apparently sunk in the head, and the capsule, especially in draft horses, bursts, and the lens is forced from its situation, and falls into the anterior chamber of the eye, subsiding there and resembling as we have before observed, an opaque white ball.

As perfect clearness and distinctness in all parts of the eye, with a due contraction of the pupil, are the most certain indications of its goodness, so the slightest dullness or opacity in the external coats, or diminution of the pupil, should lead the purchaser to be cautious; for it cannot be too often observed, that this opacity of the coats, after it has been of some standing, is almost certain destruction to the eye: and there are no remedies at this time known that can prevent its fatal termination, though numerous attempts and experiments have been instituted with this view; and the operation for cataract is useless in the horse; for if it succeeds, the vision would be still so imperfect, that blindness itself would be preferable.

Though various useful offices can be found for horses that have lost their sight; yet it is of importance for most of the purposes to which they are applied, that it should be preserved. We cannot recommend with too much force therefore, the necessity of an early recurrence to the prescribed remedies for destroying the inflammation; for, at its very commencement, it has probably only the characters of common inflammation, and might be entirely and effectually subdued as in other parts; but neglected, this disorder soon assumes its peculiar properties, arising perhaps, from the particularly delicate structure and functions of the parts affected, that in a short time it becomes perfectly beyond the reach of any remedy; for though, no doubt, there are insulated instances where this disorder has been removed, yet, as the termination of the generality of cases is of an opposite nature, it would be unwarrantable to make the conclusion from such cases of the general possibility of cure in this complaint.

Where the inflammation has not yet received the specific properties above described, the following remedies will frequently remove it; and in more confirmed cases, we shall mention the means that have been unsuccessfully employed for this end, that we may show the insufficiency of such attempts, and promote further experiment and research respecting it.

In the very commencement of this complaint, the abstinence from heating food or hard exercise; exposure to stables of cooler temperature and well aired, not from partial drafts, but their loftiness only; exclusion of too much light, or of the light altogether; diluent drinks and purgatives may be employed to the general system. To the part itself, washes of cold water or ice and water, or litharge water, the latter however has been found by Wheatly, an eminent surgeon, to discolor and thicken the parts if much used, or water with a minute portion of opium dissolved in it; others think more favorably of stimulating or caustic washes, as weak solutions of the sulphat of zinc, very dilute acids, or even spirits and water.

Blisters applied to the cheek or over the masseter muscle, care being taken that the fascia over the muscle is divided, otherwise there is no suppuration; produce an irritation which is very successful in removing this inflammation, and in particular the insertion of a seton or two in the muscular parts surrounding the eye: these will tend, as we have experienced, powerfully to carry off an attack of this disorder. Firing with a hot iron has also been employed with the same view, on the surrounding skin; and likewise blood-letting from the jugular vein, or from the temporal artery, or locally from the vessels proceeding from the inner canthus, or anterior angle of the orbit; also scarifying the vessels passing over the sclerotic coat, which become very much enlarged and visible in this disease, as those also in the lining of the lids.

Mr. Coleman, the professor of the veterinary college, seared up the vessels of the scleroticia with a hot iron, forming an entire circle round the ball of the eye, at some distance from the cornea, to prevent access of blood to this part, and so endeavoured, mechanically, to put a stop to the inflammation; it was found however insufficient to destroy the disorder, and we believe that any hope of relief from this cruel mode of treatment has since been entirely abandoned; and for this reason perhaps, the experiment has proved insufficient, that when communication is stopped from the exterior vessels, there are others whose trunks are short of these, which supply the substance of the cornea; and others again, out of our reach, on the inside of the cornea; but above all, the habit in the parts to disease, and the disposition in the system to generate it, are not overcome, the morbid tendency is not thereby destroyed.

The farriers who practice medicine, in treating this complaint, often remove the lacrymal gland (*caruncula lacrymalis*), which they call the haw, from its supposed resemblance to this fruit, and as this part partakes of the inflammation, and is much swelled, they mistake it for the source of the disorder. The removal of it, which is easily done by drawing it out with a fine hook and cutting it off, occasions a copious discharge of blood, which in slight attacks may relieve the eye and encourage them to the practice; but from our own personal experience we have learned, that in cases of any duration, it is totally inadequate to the removal of the complaint, and that the eye must obviously suffer from the loss of a part necessary to its well-being, as it collects and conveys the tears away; and since means less injurious to the eye may be equally well employed with as much or more success, such as we have before pointed out.

An infusion of the *polygonum hydropiper* injected into the nostril, so as slightly to inflame the membranes of this part, produces very good effects in this complaint.

It has been observed, that in the human eye, long continued inflammation of the exterior coats rarely produce cataract as they do in the horse; and the reason that has been assigned for this is, that the same blood-vessels which supply the *tunica conjunctiva* and *cornea*, supply the lens and the humours of the eye of the horse, which they say is not the case with the human, these parts being supplied from the eye-lids and integuments; there is however, in the horse, a singular propensity to inflammatory complaints, arising perhaps, from their highly stimulant food, the cessation of the growth about the fifth year, and from much hard work and exposure at this period; and to which disposition and to these causes perhaps it is rather to be attributed.

In the inflammation of the cornea, which is attended with a black, glossy appearance of this part, there is seldom any increased discharge of tears from the eye and nose; but in the other kinds which we have before enumerated, there is in general a considerable increase of this secretion. When blood-streaks or blotches appear, it is probable that the vessels are ruptured, and that this blood is really in a state of extravasation. Copious bleeding however from the jugular, often repeated purgatives, with counter irritants and light food are chiefly to be depended upon in reducing the inflammation of this organ.

BROKEN KNEES. The situation of the rider on the falling of his horse is often a truly pitiable one, as these accidents generally happen suddenly and at unawares, and he may be quite unprovided for such an unlooked for occurrence, and sometimes also the rider may have suffered with his horse; to make the best of his calamity we would venture to recommend the following course to be pursued in respect to his horse at least, leaving him to his own resources in what respects himself.

To draw forth his handkerchief and turning two of the corners of it to the centre or middle of the handkerchief, and folding it again, apply it in front of the knee, bringing the other two ends to tie behind, or in front, as its length may permit; first taking care if there be any loose flaps of skin, to lay them in their proper places, wiping out with the fingers any casual gravel or stones that may be adhering to them or to the general surface of the wound. Tie moderately and not too tight the handkerchief, and pin it if possible above and below the knee to prevent its sliding off.

Now lead the horse quietly to the first convenient resting place, for there cannot be much pleasure or advantage in riding a horse that has been so injured and disfigured, or if riding to a distance be imperative, let it be done with all quietness and caution. If no veterinarian be found at hand to undertake the case, we recommend the following manner of proceeding:—

First, in order to obtain as speedy and as slightly a cure of the wound as may be, and especially as to the latter, that of preventing as much as we can, any very material disfiguration of the parts, which at this present time is often frightfully the case, and diminishes the value of the horse, from the proper degree of digestion and healing the wound not being properly understood, the former being often carried on too long, and the latter at last suffered to take place by a general exposure to the air, thus making a large unsightly scab, which may cover nearly the whole surface of the original wound.

If the handkerchief applied as above round the torn knee be left on for four and twenty hours, the wound being thus wrapt up in the warm blood, no great harm could arise from it, as during this time, many of the loose points of the flaps and torn pieces of skin would be found to have adhered to their proper surfaces and attached by vacular connexion, such should be carefully suffered to remain undisturbed, and the blood which covers the wound should not be too assiduously removed, except when the masses of it are very dense and black. The general wound may then be washed over extremely lightly with a piece of tow or soft rag, dipped in Tincture of Myrrh or of Aloes, or if these are not to be had, with brandy and water, but if the parts are much bruised and hot, with simple cold water.

When however it shall be deemed necessary to remove the handkerchief, whether after twenty-four or forty-eight hours, if the lacerations have been considerable, it should be proceeded in with extreme caution and not at once, but by gentle degrees, using warm water to relax it if the adhesions be strong; for the blood is as a body of firm glue when dry, and passing between the threads of the handkerchief, it becomes as it were part of the general mass, or if a veterinarian be at hand or the rider be so provided, a calico bandage should be used, made by tearing a piece of calico of about a foot or eighteen inches square into five tails on the two adverse sides, leaving an entire piece in the middle for covering the front of the knee, which is perhaps the most simple bandage that can be contrived.

If we wash much in the early stage of the business, we wash away our best friend the blood, and if we probe much or grope it about, we shall remove points that are uniting, by gratifying an idle curiosity, the objects of which could avail but little, if known.

In wetting the handkerchief, I would not advise doing it more than was just sufficient to set it at liberty without ungluing the parts that had united, as yet very tenderly, removing however any hanging or dense masses of clotted blood, since blood is the best possible bond of union of living parts, and there can be no substitute provided like it; however any portions of it that only hang about or are become offensive are to be drawn away. The wound having been put in order and the parts brought as near their natural position as possible, we would give them a further time to unite and confirm their adherence before we begin to digest the more naked and exposed parts, by the applying a thick pledget of tow, in the lightest manner tallowed over its surface to prevent a too strong adhesion and sticking in the wound, then the bandage above described being applied over it to retain it in its situation, we leave it for another twenty-four hours.

At the third or fourth dressing, the deeper cut parts which may have been damaged by rough sharp pieces of flint or of gravel stones, should be dressed alone with small bits of lint covered with digestive, leaving the other parts to the general pledget not densely soaked, but lightly covered, so as to prevent any injurious sticking in the wound, as by dryness, or rather absence of moisture, the less injured parts will best acquire their powers of union one to another and to the general surface; this in a very few days will be accomplished as far as it need be carried; we have then only to attend to the denuded and deeper cut parts, perhaps in some cases with the sheath of the front extensor tendon cut or removed, when we now apply to the whole general surface a pledget of tow, thickly smeared with resinous digestive of stiffish consistence,

sufficient to ensure the exclusion of air and the reaching the bottom of these cut points and digesting them. Granulations will rise and successively fill these vacuities till they attain the general level of the sore, and will, if we go on digesting and excluding the air, rise higher than the surface, and perhaps become troublesome to reduce; the digestion therefore should not be proceeded with as is too often the case at present, till the wound is healed, but having attained to this point which is usually the case in a week or two—we then omit the dressings for a day or so, exposing the parts to the atmospheric air, which is the best drier we have, and closes, or reduces at least the extent of the sore, and permits the healing and skinning process to have their full operation round its edges, more particularly by the surrounding skin extending itself and creeping upon it, leaving the centre however naked, and in its granular state, that is, if the wound be large, and we have all along supposed such to be the case.

This process, if continued, will only extend from the circumference of the sore to a certain point, where it will stop leaving the central parts in a naked state, which then will make an attempt at a scab, leaving a sore of a wider and more unsightly appearance when dry, than is at all necessary, for after this exposure to the air, we again resort to our digestive, and, covering it up we shall put the parts in a state, by their renewed suppleness, to creep further over the surface of the sore, and very much to diminish its extent, not however continuing it more than a few days, when again we expose it, and thus get it by slow degrees, to almost close up: in this way I have often seen a sore larger than a crown piece brought into the compass of a silver fourpence.

When the part has scabbed over, it is best that it should be carefully protected from being hastily or suddenly forced off, as the skin has opportunity, thus sheltered, to heal and diminish the extent of the sore under it, but if it be torn off, and exposed to the air too suddenly, drying it makes a more broad surfaced patch, which never afterwards much contracts, and sadly disfigures the limb, or perhaps by such violent evulsion, tears open the wound and renews it; it should not therefore be allowed to scab before it has contracted to a small space, using a little tallow only for the last dressing, such being a sufficient covering. For nothing can be more senseless and mistaken than the manner in which these cases are often treated, leaving the knees a horrid spectacle of bunches and large scabs. On a recent injury of this sort, a common application of the grooms and farriers is gunpowder and lard, which by its blackness, certainly very much conceals the mishap, but as the gunpowder is chiefly made of nitre, and nitre has no digestive or healing powers, and applied to a wound, will probably have the effect of keeping it in a negative sort of depression and chill, and at length, which is usually the case, getting wiped off or dried up; the wound is left without a covering, exposed to the air, and quickly forms a large scab of the extent nearly of the original injury.

We may now consider another also not very unfrequent condition of the accident; and instead of a violent laceration of the skin and subjacent parts, we get perhaps only a very severe defrication or scrubbing, from the great force with which the parts have met the ground, and from the weight and actions of the horse at the time of the fall, attended with a loss of the hair, sometimes of the cuticle, and it may be, extending also to the *cutis vera*, destroying the roots of the hair, or partially injuring them: this state of things, though not in

appearance so terrific, yet in the cure may be attended with more difficulty, or at least requiring more consideration and attention than a mere laceration of the cuticular covering, that is, in the obtaining a good surface of natural looking hair upon it, without its being white, short, or curly, since it may be often observed, where hair has been much disturbed or removed on the shoulders, withers, or sides of the animal, by the defrication of the harness, that white hair usually succeeds. To prevent such a result as the friction which attends a fall, if severe, is ever accompanied with a great heat of the parts; first and as speedily as possible, it is proper to foment them with cold water, and even if none such be at hand in the moment of the accident, it may be well to lubricate them with saliva, which not drying very rapidly, may be of some help in such a case.

To procure a favorable state of the skin for re-producing the hair, the constant application of grease of some kind to the part is necessary, perhaps tallow from its oiliness and consistence may be as good as any; if it should be thought not stiff enough, a little bees' wax may be added to it, and if the hair be of a dark colour, a small portion of pitch melted with it would afford it; lard has the objection of becoming too thin and fluid from the heat of the parts, to be long retained upon them; it may however by such as prefer it, be united to wax or pitch in the above way, though not easily. This application should be renewed every morning till the hair is fully formed again upon the parts; and if, during the first few days at least, the application of a thin calico bandage of the description above mentioned may not be without its use, in shading and keeping the parts more cool, and obstructing the too rapid flying off of moisture; stroking the hair down in its proper direction when it begins to appear, may also very much tend to prevent its being curly, and encourage its length and proper color.

To recur again to the more common cases of broken knee, our business appears to be then not to dry up the sore too hastily, as that will disfigure the part, but to let the process proceed gradually but not protractedly, as is too much the case at present, and without much of system. As a digestive, we may use a mild, warm, resinous compound, made of common resin, softened with common olive or linseed oil. Common turpentine, the usual resource of farriers, which we consider on account of the spirit of turpentine contained in it, of too stimulant a nature and where a certain stiffness in the compound is required, not stiff enough; the former, from a long experience, we can vouch for giving general satisfaction, beyond any composition we have ever known, and also as recommending itself by its extreme cheapness; for some further observations on it, see *Pharm. Equina*, 3rd ed. p. 36. It is applied most conveniently and easily by forming a lock of tow in the hand, by the usual process of pulling it out and turning in the ends, and is then charged with the dressing, not by any knife or spatula, but simply by smearing it in drawing it over the surface of the ointment contained in a large gallipot, by which we leave adhering a mass of any thickness we desire. It was a common practice with us, in commencing this art, to use this digestive till the sore was entirely healed, which often took a very long time, and elevations of flesh would often arise; for florid luxuriant growths, if parts are left uncovered and neglected, easily arise in the horse, and are troublesome to subdue. Over these elevations of the flesh,

the skin or cicatrix appears to have but little power of extending itself, and the parts would remain a very long time unhealed, for formerly we used, as we have said, to go on digesting with our ointments to the very last; these luxuriant growths, if such have been allowed to occur, must be reduced by covering and pressure and dissicatives, and if very large, by the knife and cautery; smaller ones, if recent, a drying air will usually subdue, and the mildest measures, if they will effect the purpose, are ever the least detrimental and best. In this way, much loss of time, of suffering, and of desightment will be obviated. If sinuses form, we resort to the *conglutinum*, which usually quickly closes them.

When by carelessness in cleaning the horse, as by a too free and rapid use of the currycomb, a scab has been torn off, as will sometimes happen and should be carefully guarded against, whether on the knees, hips, or other parts, and which we have had sometimes to experience; we then have applied to the denuded and abraded surfaces, the finest scraped powder of charcoal, which adhering, would prevent an excessive discharge and ill condition of the sore, and falling off from time to time, induce a better healing, rather than by a total exposure to the air, with no covering at all, which is often inducing a florid growth; this proceeding may perhaps in many cases be further improved upon, by dusting these surfaces with Fuller's earth, steatite, or calaminaris powder.

In finishing the cure of these cases after the healing, which are at this period often neglected and not attended to, the young tender growth of hair should not be suffered to get too dry, or their roots impoverished by want of succulence, being weakened by a too free exposure, and thus grow deformed and curled; the parts therefore should be kept during this process, assiduously covered and protected, shaded by some thin soft wrapper, and the hairs be dressed with deer suet, or fat of some kind every morning applied fresh, sometimes washing the parts with a little soap and warm water, or if the part appears hot, with cold water, giving the hairs a proper direction with a piece of a tallow candle to keep them straight.

In this way, even old neglected cases may be brought into some tolerable condition, and others rendered with difficulty visible, whilst a careless treatment in drying up the recent wound with the after inattentions, would render the parts bald and unsightly to a great extent.

We have now to contemplate and consider yet another condition of the accident of the falling horse, where not only the skin is torn up or entirely removed, but where the parts beneath it are injured also, and it may be, the joint itself laid open; when so triste an affair takes place, it is, if it be extensively laid open, the best conduct, mercifully to destroy the animal and finish his miseries at once, rather than to go through the terrible sufferings that usually terminate attempts at cure in these cases, which can only be effected at the expence of the motion of the joint, viz. by ankylosis, when the animal is of little or no use; it may however happen where synovia is given out and abundantly, that the tendon only is suffering, its sheath having been damaged or removed. In this case, there are hopes that nature, if duly aided in her endeavours may repair the damage, and such we have seen; the resinous digestive is then our best resource, not using it altogether for its digestive qualities, but as excluding effectually the access of air, and affording opportunity for union to take place, under its guardian protection,

availing ourselves of its tough and plastic properties, the ointment being made sufficiently stiff and tenacious for this purpose, and liberally applied, small cases of opened joint have yielded to its application. In worse cases, it may be well perhaps to confine the knee by splints, from all motion whatever during the cure, which would we apprehend much contribute to the success of the attempt, nature a little aided by art being most powerful in her resources, although in very desperate cases, it is better at once, as we have said, to destroy. If a reparation of the breach in the joint can be effected however, there is the more hope that the horse may be rendered useful, for some low and not very violent service, by the circumstance, that there are seen two ranges of bones in the knee, and it would indeed be a hard case, that both of them should be laid open by the fall, and one would supply a slight, yet sufficient degree of motion to the joint, for such humble purpose. A most careful exclusion of the air is always necessary, in these cases, otherwise a high degree of inflammation of the joint itself will take place, with a copious flow of thin, hot, synovia, terminating the case usually by a fatal irritation, extending itself along the course of the tendons and other connected parts.

In a case where the opening is small and fistulous, a light touch of the actual cautery will have excellent effect; which seems to operate by arresting the flow of synovia, closing up the wound by a solid plug, the lymph flowing out being arrested in its course, rendered solid by the heat, gives a favorable opportunity for the union of the injured parts, by adhesion of surfaces.

We now bring to a conclusion this small essay on broken knees, without any remarks on the causes contributing to so many funeste accidents, for they are daily occurring and to all classes of society; having aforesaid sufficiently exhibited that the horse is not a tumble-down animal by nature, the Almighty ever making every animal firm on his legs, that it is the effect of the shoeing with an inflexible hoop of iron, destroying by it the structure and functions of the foot, and this it is that is the cause of so much calamity, which is not only simply stated, but demonstrably proved to be the case in the work we have alluded to, entitled *Podophthora*, to which we beg to refer the reader's most serious attention. And not only are the knees of horses broken, but hundreds of valuable human lives sacrificed also to this defective and foolish principle of defending the foot; an error in principle, scarcely before suspected, and certainly not at all understood.

BURNS AND SCALDS. The horse, like most other wild animals, has a remarkable innate dread of fire, so much so, that on this alarming visitation, they are but too frequently the victims of it, and perish miserably in the flames, and are thus put beyond the reach of the veterinarian's skill: blinding them by covering their heads, is generally resorted to for delivering them from the impending danger, and their release should ever be a first care on these occasions, for horrid must be the sufferings and death of so large an animal when proceeding from this cause.

Where, after a partial exposure to the effects of the fire they have escaped, we should first propose affusions of cold water, abundantly supplied to the parts burnt, so as to take out all sense of heat and of pain from the parts suffering, which we believe from oft experience on our-

selves and others, to be the most natural, simplest, and best means of obviating its ill effects, and the sooner recourse is had to it, the better for preserving the parts from death and sloughing off.

But, although this remedy appears to be very simple, and we believe it to be the best of any, some law or discretion appears to be necessary, in many cases at least, for its administration, and which law is simply this, not to carry the cooling process too far by chilling the parts too much; for after so high excitement as the heat has produced, the sudden reduction or expelling of it, to an extreme the other way, may endanger the death of the part, and occasion extensive sloughings to take place. The point therefore to be aimed at, as it appears to us is, the point of *no pain*, which in the human can be readily known, by inquiry of the patient; but not so in the horse, where therefore more attention to indications of his feeling, and other indications as by the touch of the hand by sight, or otherwise, by which he might tolerably well ascertain the actual state of his patient. The pain ceasing, we immediately desist from our labours, by the remission of the cold affusion, and on the return of it, which at first will be after a very short interval, we again resume our labours and continue our attentions, waiting after each application to watch its effects, till the pain finally ceases to return, by which the parts may be wholly or partially preserved, and breaches in the skin, where the fire has been sharply applied or long continued, that may happen however, and cause ulcers and sloughing of those parts, such are to be treated with the mild cooling ointments, as the cerates, or the spermaceti ointment, till they are in a state for cicatrizing, when a temporary exposure to the atmosphere, from time to time, will much facilitate their closing up and skinning over, using digestives however if necessary, for the granulating and filling up of any deeper vacancies.

This salutary method of treating burns and scalds, we may perhaps best illustrate by a case which actually occurred to us, than by any generalizing upon it, and which case occurred to us early in life and was under our own notice, and direction also, in the way following; and which probably by the common methods we have been but too often witness too, of drugging and ointments, would have been attended with great suffering of the patient, and been several months in hand.

Whilst studying at the Veterinary College about the year 1794, I was one day invited, by a gentleman of Finsbury Square, sometime since deceased, which enables me more freely to speak to it, and who was a great admirer of horses and possessor also of some very remarkably fine ones, to dine with him, and after dinner wine was brought on the table from a large wine cooler or cellaret, which stood in a corner of the apartment; after an agreeable afternoon's conversation, the evening approaching, tea was announced in the next room, and from whence, very shortly after, proceeded the most violent screams from a child and various female voices were heard, and, with horror depicted in his countenance, entered my friend and host, who had but a few moments before left the dining apartment, exclaiming—"For God's sake come immediately, for I have scalded my child to death." Having, as he explained afterwards, had a few rough words with his wife, he had upset the boiling tea-urn into his child's lap, the whole contents having been received on his legs and thighs.

On my entering the room I found various women assembled round the child, whose cries had

called them into the room, who were busily employed in stripping his clothes off, and his cries were indeed most vehement; the skin seemed to be peeling off in following the stockings, and I begged of them therefore, to desist and leave him to me, and immediately ordered the capacious wine-cooler to be brought from the next room, and into it I immediately plunged the child, just as he was; and, after being there a very few minutes, he found himself so much relieved as to cease crying, and even was laughing with his mother and attendants. I now took a pair of scissors, and slipping them through his dress entirely disengaged him from it. On finding a cessation of the pain, I withdrew him from his bath, and in a very short time his roaring recommenced, and by immersion his pain again was subdued, and in this way we continued immersing and withdrawing him for nearly two hours, when, being tolerably free from pain for a long period, he was carried up stairs to a bed-room and laid on the bed, wetted cloths being applied wherever the pain appeared; and finally, as I thought they rather began to despise the simplicity of my remedy, I wrote a prescription for some goulard to mix with the water, and which was continued occasionally during the night. It being warmly solicited, by my friend, that I should proceed with the case to its conclusion, I dressed with mild cerate, sparingly applied to the sores, wherever the cuticle had been denuded by their too hastily tearing off his dress, and in about four or five days my little patient wanted no further assistance. Other striking cases I could give, but they would be much of the same complexion. I therefore desist, where by the application (not of evaporating lotions, as they are called, or dabbling with the hundred and one nostrums for burns,) immediate cold, by potentially subduing the dire effects of heat, and by bringing the parts only to their natural feeling and tone, I destroyed all the suffering, and produced a sore also that quickly healed.

So that I confess myself on most occasions, if not all, a decided advocate of counteracting the effects of heat by the direct application of cold; ill effects have arisen from such treatment, there is no doubt, but this has proceeded from not observing the laws required by the living animal economy, which should be strictly attended to in doing it, and not to do it at random. I consider this much better than the bit-by-bit process in applying moderately stimulant lotions to the parts, by which the heat is retained in the part for a longer time than is necessary, and perhaps, by its exhausting effects destroys the vitality of the parts, with injurious consequences. That there is danger in chilling the parts that have been over-heated and extremely excited is certain, as in the converse case of warming too suddenly parts frost-bitten; but then it is by abusing the remedy, and going too far with it, and running into the opposite extreme; as we have pointed out a sort of grade in doing it, such generally may be resorted to. Solid ice therefore, I would not, at any rate, in severe cases, resort to, as it might be so easily abused.

And I admit that in regard to cold affusions to the horse, after the effects of fire upon this animal, may be attended with some little difficulty to know exactly when to desist, since we cannot, as in the human, ask questions of our patient, to ascertain the precise point of *no pain*; however, it is certain that, in this respect, it is not so absolutely necessary, in usual cases at least, that this point should be so very exactly ascertained, and that if we aim to come as near to it as we can, from our own feelings of the part, and from our views and reasonings on the case, and by the animal's own indications, we shall arrive near enough to do what is required, without much fear

of any very ill consequences, and thus save the animal much suffering and ourselves much troublesome labour in the after-treatment of those ulcers that may arise.

If the water, from being procured above ground, should not be found cold enough, a few pieces of ice, if procurable, might be added to it; or, if this was impracticable, some sal ammoniac pulverized, to render it more speedily soluble, thrown in, would make it several degrees colder.

The above will suffice for thousands of common cases of burns and scalds; there are however, it must be admitted others, of most dreadful burns more particularly, and of a more extensive injury to the parts, where the system appears to receive so great a shock that she never rallies again, and, whatever is done, it is all alike, nothing succeeds; such cases, in the hospitals, treated for the most part with spirit of turpentine, generally end fatally, and death closes the scene often in rigours and chills, and where it would appear wrong to apply cold; possibly, however, if the heat had been subdued very early after receiving the injury, there would have resulted a better chance of saving the parts from death and slough, than by using measures only partially suppressing the fatal presence of this heat, by only half combating it by those stimulant or warm measures, a view that perhaps may afford a subject not totally unworthy our consideration. Desisting however, from any further speculation or suggestion on these dreadful cases, I am well assured, from frequent experience on myself and others, that the generality of cases of scald and burn, will give way most successfully to the direct application of cold, and that where ulcers do arise, they will yield more readily after a treatment of this sort than by the common treatment, which leaving the heat longer in the parts, occasions also much more suffering.

ON CASTRATION OR EMASCULATION.

ALTHOUGH many pretended improvements and novel proposals for performing this operation, are continually being presented to the public, none we believe to be better, and we speak after considerable experience, than the old operation of all. I have followed it, with an uniform success, through a practice of forty years and upwards, and with invariable satisfaction, not having ever lost a single case, though at times cutting old horses, whose lives I ensured to their owners, before the operation, at a small advance in the premium of two guineas, the usual and proper fee for a performance of this kind*.

A plan, which at first was thought highly of, for castration, by my friend Wm. Moorcroft, was by ligature,—the enclosing of the spermatic chord between two pieces of stick, or of one par-

* And which the public, we believe, should on their part be willing cheerfully to pay to a well and regularly educated practitioner, if, at least, they wish to maintain a respectable class of persons in this profession, and not to suffer it, with bad consequences to themselves and to the animals, to be subject to the reproach which Vegetius tells us obtained in his days; "*Ars*" he says, "*exiguitate mercedis jamdudum collapsa est.*"

tially cleft, so as to stop all circulation, when the parts consequently mortified and came away at the constricted part; and Moorcroft proceeded to castrate a horse in this way, but the irritation which ensued was so great that a general inflammation took place, extending to the abdomen, and which destroyed the horse. My friend Richard Lawrence tried also the same operation upon a very valuable horse at Birmingham, as he informed me, and with the same fatal results, and which, as it happened in his early practice, did him much injury.

The magnificence of the generative system of the horse is remarkable, of which we formerly endeavoured to give a sketch in the Cyclopædia of Dr. Rees, and which has, without his knowing probably of my previous labours, been partially described again by my friend J. Earle, surgeon, of Bartholomew's Hospital, in a communication read at Cambridge, 1836, before the British Association.

The almost ungovernable effects of this noble machinery on the frame of the horse, has been noticed by Virgil, in the following beautiful lines:

Nonne vides ut tota tremor pertentet Equorum
Corpora, si tantum notas odor attulit auras!
Ac neque eas jam fræna virum neque verbera sæva,
Non scopulæ, rupesque, cavæ atque objecta retardant
Flumina correptos undâ torquentia montes.—GEORGE. lib. 3.

In some countries of the East they are said simply to crush the testicles, and not extract them; this, though simple, would seem rather an uncertain way of destroying the masculine vigour, and we should apprehend, like the above operation, would create in the end, a source of more pain and suffering than the extraction, but not having tried it, this is only mere conjecture. In France, where the crushing between two sticks was introduced, a caustic was also enclosed between the sticks in contact with the chord, formed of tallow and corrosive sublimate, cutting away the testicles at the end of forty-eight hours; now as this could not be performed without casting the horse, there seems very little trouble saved by this mode of doing it.

The ancient and common operation, to which we vastly give the preference, as being less painful considered altogether, and less fatal in its results, is done in the following manner, and requires generally no secondary attentions, which must ever be, from the situation and tenderness of the parts, extremely difficult and dangerous.

The horse being cast on a plentiful bed of straw, is placed on his back with his legs in the air, being supported in this position by a truss of hay or straw on each side of him, one of the hind legs or both is drawn forwards to the neck, or fore legs, which affords a convenient opportunity of getting at the parts. Searching for the *scrotum*, the testicle is grasped with the left hand so as to extend and present a smooth surface of the skin of the scrotum; an incision with a scalpel is then made of about three parts of the length of the testicle. Some use a hot iron, in preference, to make this incision, which we never practised, believing the other less painful, and better for subsequent healing.

The skin being divided, the testicle rushes out, and we next divide the tendinous expansion forming the *tunica vaginalis testis*, carefully avoiding the cutting into the body of the testicle; the testicle itself then presents, with its beautifully vascular surface, and is easily pressed out of its coverings and seized upon, a pair of clams being at hand; the chord is included, and held together pretty forcibly so as to stop all circulation, observing that if the animal struggles, which he is sure to do at this point of the work, to ease the clams to him, and not to resist, as that will tear the chord or its envelopments within the abdomen; the section or division of the chord with the scalpel or the hot iron, it matters not much which, as all sensation must have ceased on this side the clams, that we rather give the hot iron preference here, as it stops the effusion of blood. It is well not to divide the chord close to the clams, but to leave a full quarter of an inch of the chord or epididymis, which some think best, over, for the hot iron to act upon in closing up the spermatic artery and vein, which if close to the iron cannot so well be stopt from bleeding; it is usual, after a gentle searing, to scatter some powdered rosin upon the parts fired, and to melt it over them, for the further security of the vessel, which, if it should bleed after the operation is over, would be highly dangerous, the small projection beyond the surface of the clams is easily moulded into a neat ridge or seam, by the hot iron, that will effectually secure the vessels. The clams being now opened with the greatest care, easing away with the fingers the adhering chord from the surfaces of the forceps, as by pulling them open rudely we run the risk of tearing open again the closed vessels, which, if disposed to bleed, we again close the clams, and touch them again with the hot iron; this done, we return the parts into the scrotum, washing away any clots of blood that may have lodged there. After this searing, it is usual, and a beneficial practice we believe it to be, to wash the parts well with cold water, or goulard-water from a bottle; some fresh lard being taken we rub it into the groin, and all the parts that have in any way been concerned in the operation, to supple and ease them in the subsequent swelling and irritation which will soon take place. A considerable enlargement of the scrotum and of the sheath of the penis follows, and a discharge of yellow lymph and pus often succeed; after about a week, the parts healing and the swelling gradually subsiding, the horse is again returned to his labours.

At about two years old is reckoned the best period for gelding; the older they become, the more danger and more resistance; we have castrated however, as late as seventeen or eighteen years without their dying. The time of the year is not much regarded, nor, as formerly, the age of the moon.

The effects of gelding upon the make and shape of the horse and his passions, we shall not here enlarge upon, as not being necessary, or its effects upon his voice also. We now are induced to subjoin a few hints respecting the fatality of this operation in some hands to what it is in others, which we believe to have proceeded from an inattention to some circumstances not usually noticed: one is to be careful not to leave any of the investing membranes or coverings of the testicle undivided, but to see them fairly cleared away; some, I am satisfied, careless or ignorant wholly of the anatomy of the parts, have, on the skin of the scrotum being opened, and the testicle protruding, proceeded to use the clams; seeing a highly vascular membrane, they mistook it for the testicle, and so enclosed the *tunica vaginalis testis* in their clams, and made that to undergo

the compression, as well as the spermatic chord, which inflaming and communicating with the abdomen destroyed the animal. From momentary inattention I had nearly done this myself on one occasion, which served to point out to me this source of danger. I once castrated a young horse in Essex, for a farmer; a farrier in the neighbourhood, in a sort of bravado, castrated two on the same day, to see which would be well first; both his died, mine, at the end of ten days, was pretty well recovered. The death of the man's two colts, I much suspect, proceeded from some bungling of the above description; and this also it is, I suspect, that renders the sticks operation so fatal. This bad plan, though brought out every now and then as something new and wonderful, is as old as the days of the Romans, and was recommended by Palladius, (a writer in no great esteem in those days,) at least for the poor calves; neither the Greek writers or Vegetius say any thing about the sticks operation.

Above all things take care, in the struggles of the animal, and retraction of the parts, on fixing the clams*, to have a very light hand, and to let them follow easily and without resistance, all his movements.

ON SPAYING THE MARE. I know of only two instances of this operation being attempted, both by my friend William Moorcroft, who was a very dexterous operator: the first was on a mare procured on purpose from the slaughter-house by way of experiment, she died; the other attempt was on a valuable mare, the property of a gentleman, who complained of this animal for being continually horsing, to the offence of his lady, being employed in his curricule; she was next operated upon, and also died; that it seems however it may suit pigs, not to suit horses.

Would it not have been better, rather than sacrificing so valuable an animal, to have exchanged her for a gelding, or to have covered her posteriors with a net and tassels, &c., so as to conceal any appearances of the kind, rather than resort to so uncertain and so dangerous an alternative.

* Experiencing considerable pleasure in unravelling words, where I can, rendered often almost unintelligible by a succession of corruptions, so, as to this technical word *clams* or *clam*, which I conjecture was in its first application probably *clamp*, a common machine of the upholsterers for connecting a succession of flat boards to each other, consisting of two parallel bars conjoined by a rectangular piece, forming together three sides of a square, and by passing through two staples connects these boards to each other. The word *clam* or *clams* however having obtained a technical signification in this art, and as serving to distinguish a particular and useful instrument, we shall exactly retain it as it appears, although a barbarism and of no proper meaning in itself. Both the above titles have their origin, there is little doubt, in the Latin word, *claudio*, to close or shut.

As to the instrument itself, when properly made, we apprehend it should be moderately long, as a foot or more, including its handles, and not very wide or thick, heavy or clumsy, enclosing and bruising more of the chord than is necessary, but rather thin and light. The two blades should meet by means of a projecting hinge in two parallel lines, when at about the eighth of an inch asunder, and it should be provided also with a clasp to keep it fixed without holding whilst embracing the chord.

ON THE CONGLUTINUM. Having been among the first, if not the very first, who publicly recommended this useful article, more than forty years ago, and having given in the *Pharmacopœa Equina* the prescription for its preparation, we desisted there, as being out of place descanting on its uses, or the giving examples of it; here therefore, with more propriety, may be given a few successful cases of its application.

Having first used it with extraordinary success in cases of quittor, I was induced to use it in other obstinate cases of sinus that refused to yield to common dressings, and one of the first of these cases was a violent bruise of the leg, which had led to a disagreeable sinus, and appeared to be communicating with the sheath of the tendon, or perhaps the tendon itself, giving out much glare or synovia mixed with pus; by injecting into it a strong solution of the sulphate of zinc, the abscess soon healed, and the sinus became obliterated, that I began to suspect it might be used in many kind of cases, preferably to the knife, in laying them open, as we were used to do previously.

In cases of quittor, on using this preparation, a violent swelling usually supervened, which rendered the use of a poultice necessary after it, and which, by keeping the integuments moist and easy, very much contributed to the cure, also removing the lower part of the hoof away, opposite the injury, from taking any bearing on the shoe.

I further experienced the extraordinary powers of this remedy in procuring adhesion of surfaces and in the obliteration of old sinuses in a withers of Mr. Sheppard's horse, where a deep sinus which appeared to communicate with the extremities of the dorsal or long wither processes and which gave way to the injection and healed presently.

The next was the case of my friend, William Forster's horse, of Tottenham, which had received a violent kick on the inside of the hock, which laid bare the tendons, which could be seen working in and out of the sore, when the part moved, or he bent his leg, this also united and healed by the use of the injection in a short time, though discharging thecal synovia abundantly; in this case, however, as in some others, an abscess formed, in consequence of the sudden healing of the wound and which did considerable mischief to the joint. That this powerful agglutinent should be employed with some care and discretion, and we found in this, and other cases, the great use of largely poulticing after its use, to sooth and quiet the irritated parts and those connected; in foot cases we found this particularly necessary, as in quittor. After this I have no notes, and how the case finally terminated have no distinct recollection, having myself not seen it after.

In a case of a large grey dray horse of Messrs. Tickels, (1812,) which had received a most violent contusion and cut in the front of the gambrel* below the stifle. I endeavoured to heal this wound by the first intention, but a large abscess was left notwithstanding, and discharged a red clotted pus, like coffee grounds. I employed the *conglutinum*, and covered the external wound

* Probably from the French *jambe*, the diminutive *bril* being added, signifying the little or lesser leg, the thigh or greater leg being above it; it is in fact the muscular assemblage in front of the head of the tibia, and we preserve it, though not often used, as affording us a ready and useful distinction in speaking of this part of the limb.

with a pitch plaster, injecting it with a pewter syringe through an opening or slit in the plaster. The swelling became reduced, the lameness went off, and in three weeks he got perfectly well. The injection thrown in did none of it return, but must have insinuated itself between the muscles, or between the skin and muscles, and have been absorbed; and, to our surprise rather, it produced no ill consequences, the wound healing rapidly.

Sampson Hanbury and Co.'s black dray-horse had been pricked through the sole by a nail, and refusing to heal, a mulberry nipple was formed and presented at the orifice, and which is sometimes difficult to subdue, by dipping a small ball of tow in the conglutinum, and pressing it against the sore, and keeping it there: it healed in a short time.

David Ricardo's bay coach-horse, a very noble animal, recently after purchase for two hundred guineas, had a swelled jugular vein from being bled: it broke out in two places, and I first applied lunar caustic to the wound, but found it not succeed in uniting it. I next tried the *conglutinum* (see its composition in the *Pharmacopœia Equina*), and the aperture was soon closed, and the neck did well. I had seen most troublesome cases proceed from such sores in my former practice. Especial care was taken in this case to prevent the horse, high fed and impatient, rubbing his neck after the application of the remedy, by turning him round in the stall, and keeping him tied nearly all day between the two heel posts of the standing, and this for two or three days when not feeding, and, as we have said, when the wounds were fresh dressed.

Another beneficial instance of its use occurred in T. A.'s horse, of Merton Mills. He had been severely cut under the fetlock joint by a broken piece of glass bottle that stood upright on its bottom in the water, on which it appeared he had trodden. On my being called in, he was found in great pain, holding it up from the ground, which evinced that thecal inflammation had commenced; there appeared also a discharge of thecal synovia. I notwithstanding determined to try the effects of the conglutinum, to see if I could arrest the discharge, and introduced it into the wound with a feather. I then smeared some lint, a broadish piece, thickly covered over with softened rosin, or rosin digestive made stiff and tenacious. I next covered this with a larger plaster of the same, on a denser mat of tow, and kept them well to the parts by a calico bandage, and over all a soft poultice. The pain went off; and by repeating the dressing every other day, in about ten days he was perfectly restored.

A singular case of its use occurred to me in a dog, a very fine Dalmatian spotted coach-dog, belonging to Alderman Cox, where the two tables or skins of which the dog's ear appears to be composed were detached and separated to a considerable distance or extent, so as to give the ear an enlarged, almost globous figure, on both its sides. I opened the tumor with a lancet, and found it contained fluid of a glarey consistence, and then injected into the cavity the *conglutinum*; the detached surfaces immediately adhered, and were never troublesome after, giving much satisfaction.

We have, we believe, already stated, and it cannot be too often repeated, that the use of this powerful agglutinant was frequently followed, especially in deep cases, that on the closing of the old, a formation of new abscesses took place, but not of the same extent; and gene-

rally, I believe I may say always, yielded finally to large and frequent poultices; some required a second opening however, and a second injection, as in the following case.

T. M.'s horse, an old quittor case, was soon healed by the injection, but it broke out again farther on, in the front of the foot; I continued however to apply it to the new opening till it got well.

Alderman Price's horse, with a sinus or pipe from a tread originally, got well presently by its use, and many others; some, however, apparently from the depth or tortuous direction of the sinus, required the use of the knife, and others swelled and broke out in new places, but healed not long after by assiduous poulticing. See Dissert. on this troublesome disease Quittor, and its Cure, London, 2nd edit. 1834.

I also applied it with good effect in several cases of neck vein tumefactions and ulceration, from the effects of bleeding and pinning up; the pin if passed too deeply, or being rubbed or torn out by the horse against the manger. It may often, when the stream of blood is small and not very free in flowing, be quite unnecessary to use any pin at all, the insertion of which, and the bruising of the parts attending it, is often more painful than the operation itself. I have frequently omitted it, and never had cause to repent of so doing.

In the above cases of the swelled vein, the conglutinum was simply applied with a feather; and cases that used to require weeks to get them well, were healed in a few days. Others would extend along the course of the vein, and resist for a longer time, in spite of all endeavours. See art. Bleeding, *Surgery of Horses*, p. 11.

DOCKING THE TAIL. By this term is understood the shortening or amputation of the tail of the horse, and which is simply performed by enclosing the tail at the point to be severed, in a deep notch formed in a wooden lever of some length, as two foot or more, with a blade of steel in the upper limb working on an hinge; this blade is of a circular or diagonal figure, and, urged by the lever of the handle, instantly removes the end to be cut off. The tail, I need hardly say, is denuded of the hairs being turned back from the part and tied above, and is carefully removed from all about the part intended for division; and it is surprising often to see how little resentment the animal exhibits at this lopping off of his noble appendage.

The bones composing the tail of the horse are long and solid cylinders, with enlarging extremities for articulation, and projecting lateral processes, which receive within them the muscles and tendons of the tail, and, still nearer to the bone, inclose and defend the arteries and veins, the former usually squirt out the blood to some distance on the removal of the tail, and generally require the application of the cautery to arrest it. This is usually done by a flat iron ring with a long handle to it, the hole in the ring franchising the central bone, and permitting the ring itself to have a more free access to the bleeding vessels, closely lodged in its recesses.

These painful nickings and dockings would not be so much sought after, we believe, if other consequences did not result from them than the effects produced on the appearance of the tail; much trouble is saved to the attendant groom in dressing and looking after it, and keeping it clean; and there is also a small perquisite attends the sale of these hairy ornaments, the upholsterer finding them the most elastic and best stuffing of his beautiful squabs.

In docking there is little danger; but in nicking, if really and efficiently performed, it is otherwise, and there is a degree of danger attending it. It was an unfortunate case of this sort that in a singular manner, led me to write the Essay on the Bots of Horses. An exceedingly beautiful mare, belonging to a banker of Kingston-on-Thames, was nicked by a veterinarian expressly sent for from London for the purpose. He exhibited a brisk purgative to her previous to the nicking, in order to prevent any inflammation proceeding from it. In a few days afterwards however, inflammation of the tail supervened, and extended to the rectum. In his alarm, and to arrest the progress of it, he administered an ounce dose of opium; the consequence was, that the system having been previously debilitated and lowered by the physic, a most violent inflammation of the bowels ensued, which speedily terminated in the death of the animal. Living at that time at East Molesey, at my brother's, I was sent for over to her, to see what could be done, but found her dead on my arrival. I proceeded however, out of curiosity, to open her, and found her intestines generally and other viscera violently inflamed, and attended with that peculiarly disagreeable odour, which always accompanies this sort of death from opium. Opening the stomach, I discovered a cluster of bots, and cut them out with the piece of stomach to which they adhered. Passing home through Bushy Park, sitting myself down beneath one of the spreading chesnut trees, I proceeded to dissect them; and being very much struck with the beautiful pearly appearance of the air vessels, and which was then new to me, I drew up some account of it, intending it for the Linnean Society. I found however subsequently, that the fact had been observed before, and therefore was hardly worth notice; some other facts however were new; and still adding by farther researches to these, I at length presented the paper to the above Society, who thought it worthy of a record in their Transactions, vol. iii. p. 289, to which I have since further added at various times, as opportunity offered, making it a separate treatise.

In docking, the number of vertebrae to be removed is quite depending on the taste, caprice, or fancy, of the operator, or, it may be, the owner of the horse; and very variously is this taste exhibited, from the naked stump or short dock of the large waggon-horse, to the long cut of what is called the *blood*, or *nag tail*.

This proceeding of the amputation of the tail is less practised than it was formerly; and nicking also is much less prevalent, especially deep nicking, without which but little good is really done, or alteration made in the set of the tail; and the reward being pretty much the same for the one as the other, in the practice, therefore, so much trouble is often saved.

The extensive omission of these nickings of the tail plainly proclaims the improved taste of the times, in regard to these animals; and of cropping the ears, we hardly now see anywhere an example. When I first began these pursuits, at the very first opening of the Veterinary

College, fifty years ago, I wished much to possess myself of drawings of all the variously cut tails then in vogue, at a time when the tyranny of the stable was at nearly its height; and so great was it then, that few dared to interfere with the grooms in their department, and they ruled all with a despotic sway; even the master himself would be in danger of a rebuff, if he should humbly venture an opinion. Things however are much changed since that time, and sense is taking place of absurd routine; and still more recent discoveries, in the foot and shoeing art especially, and in other departments of the art, have placed the knowledge of these animals fairly out of the reach of the entirely uneducated.

The above drawings were done, at my suggestion, by my friend Sydenham Edwards, who had a singular taste and power in sketching after nature; and I had thoughts of recording them as a curiosity, by a lithographic representation; but on considering the very fluctuating taste of the public, and the danger there might be of again reviving such practices, at present fortunately on the wane, and comparatively extinct, I thought it safest and best to destroy it. The number of drawings in this curious exhibition amounted to no less than eleven distinct varieties of tail, from the short, naked, *bob tail dock*, of the great waggon horse, to the nag or switch tail; however, as the former was amputated so very near to the fundament, it was not unattended with real danger, and we have seen above that nickings less close, if deeply cut, were attended with danger also, as was the case of the above mare. To return however to the operation itself.

In docking, it is almost impossible to determine whether the knife shall fall upon and divide the body of the bone, or its articulation; if near to the articulation, there will generally be a sloughing off of the extremity of the bone so cut, before it finally heals. And it is usual, and highly useful indeed, to apply a little rosin to the part, and to burn it on with the cautery that is used for staunching the bleeding. If ulceration should follow, the wound is best kept dressed with warm digestive of softened rosin, to protect it from the air and from chills, and in order to prevent any fungous elevations of the part.

FIRING THE HORSE WITH THE ACTUAL CAUTERY. This operation, by far the most severe of any in our art, and though called an operation, is, when executed severely, and on all four legs, amounting almost to a very martyrdom. It is indeed an infliction of such a nature, that we think it ought not to be entrusted to every man, however brutal or ignorant, to enter upon it at his own single will and pleasure; it may be possibly for gain, or to show himself the determined, expert, and *cool* operator; and perhaps, from the nature of the case, likely to be perfectly futile, and of no kind of advantage to any one, for it is often used in cases where, from long, hard, and ungenerous service and labour, the parts have been so utterly spoiled and ruined, that nothing which our art affords could avail. And sorry often indeed is such a recompense to the poor animal, after a life of shameful toil, and perhaps of benefit also, to his exigent owner.

The only way that at present appears to us as at all feasible for protecting these worthy

creatures from such abuse, would be to make it a law and custom in the profession, never to fire a horse unless by the consent and concurrent approval of three or more veterinarians, whose education and acknowledged skill, and practice in this profession, should warrant them in giving an opinion upon it as to the probable results of the operation in answering any useful purpose to the owner, so as to justify such an infliction. In this case, a small fee, as of five shillings or so, should be given the consulting veterinarians, and should not be despised by them, remembering what it is for; and be paid them before opinion given, that there should be no bias either way. By this means some remission of the infliction might be obtained, and, when exercised, an assurance that it was done with honest prospects and intentions. For many horses are thus cruelly treated that have been brought, as we have said, to a condition that nothing could ever serve, and who had well earned, and that thrice over, their dismissal from our service, and by the mildest death that could be devised for them; and such a barrier to abuse, would also much enhance the profession in the view of the public. It is, indeed, a lamentable fact that the worst state of the art brings the greatest profit to it, by the repairing, or pretended repairing, of blunders and casualties resulting from bungling ignorance; and so it is with unnecessary complexities, even in governments, and of religion herself not exempt, and most deeply is it involving the misery of mankind. Some, to excuse themselves from blame in these practices, might contend that the skin of the horse was less sensible than the human, but the reverse of this can be easily proved, since he is distressingly sensible to the impression of the smallest fly settling on, or touching even his legs; and a blister of less force than for the human skin, will readily raise the cuticle from his, that this pretence can have no just ground or hold whatever; and some, perhaps, with the poor apothecary in *Hamlet*, might say in doing it—“*My poverty, but not my will, consents.*” The farriers formerly told the people that the horse had no brains, therefore could not feel; his exact condition in this respect we now know full well, and further, that he not only has brains, but possesses also many of the finest qualities of our own nature: as, for example, a wonderful share of patience, a great generosity, and a pride of achievement in a difficult task, that particularly qualifies him, and makes him valuable for our use.

And as to his dismissal from service, some persons of truly creditable and humane dispositions, would be for turning him out in the fields for life. We do not, however, from what we have witnessed, quite concur in this very laudable sentiment. Low damp meadows and fields, chilly nights, and morning dews and frosts, to a horse long used to the protection of a stable, is no great treat; but, taken altogether, is rather a worse suffering, than the ending their lives in the most merciful way possible, which, we think, is far preferable to it. Others propose sending them to some farmers for the plough; but the farmers' men to whom they are finally consigned, and mostly are left, often do every thing with them but plough, and their life is a miserable one indeed, and lingering till they drop; and better much is the merciful stroke that at once puts a final end to their possible suffering, than such uncertain measures as these. Perhaps the reader may not be displeased also with our views as to how this last proceeding in the lives of these beneficent slaves should be best accomplished.

To dispatch them, with us the pole-axe is mostly used ; we, however, prefer the French mode used in their Abattoirs. A heavy blow on the head between the ears, or in front of them rather, done with a heavy iron mallet, stuns them so effectually that all sense is removed ; and instantly after, before any sort of recovery from it takes place, the knife is introduced at the breast, and deep enough to divide all the largest vessels about the heart, and death is nearly instantaneous, and all jealousy of further suffering removed. This we believe to be preferable to the pole-axe, which, even in good hands, which is far from being always the case, is not often at the first, or even second blow, so certainly effectual as the preceding method.

Though I could desire to discourage the cruel operation of firing as much as possible, for the sake of these worthy creatures, yet, in candour, I must admit that firing, if judiciously used, has more powerful effects than blistering, and, in certain cases, may be employed advantageously ; but then it is the mild manner of doing it, if I may be allowed the expression, that I believe succeeds the best, for in its mildest form it is stronger than a blister. Though oftentimes a blister, twice or thrice repeated, will have very similar effects. Enlargements of bone, as spavins, or curbs, the enlarged and callosed insertion of the powerful tendons at the back of the hock ; relaxed and enlarged capsular ligaments of joints, bursæ mucosæ, and sheaths of tendons from a too severe service or strains, are the objects where firing may be beneficially applied, and should be used in a very merciful manner, for it is a dreadfully severe proceeding, as the following case will testify :—

Having some years back a leisure day at Brighton (a thing which often happens to idlers there), I turned in for curiosity to a veterinary forge and found a poor animal on the straw about to be fired. I resolved on seeing the proceeding. She was a remarkably fine, lively, resolute, handsome mare, that apparently had been strained and ill-used in her work. One better built, or more spirited, I hardly ever saw. After the operation, which was most coolly laid into her on the part of the operator, she was released, but, to our astonishment, could not rise. Her struggles, which had been most violent, had broke her back, or apparently, her loins, and nothing remained then but to finish the business by knocking her on the head. Another case, of not quite so fatal issue, and in which in truth, I must acknowledge, I was myself concerned, was of a large fine cart horse, who burst his lungs, and became broken winded after ; whether the fall did it, which was very sudden, or his struggles, I cannot tell. The firing here was not severe.

We now advert to the operation itself, which consists in drawing lines (more or less distant) on the parts to be fired with the red hot iron ; the hair being previously removed with the scissors. It is curious that we are made acquainted with the precise period of the commencement of this fiery practice by a passage in Vegetius, and that it began in his own life time, and as he lived under the emperor Valentinian II, the time or period of it is strictly ascertained ; and that it was in the decline of that empire, or at least after its brightest periods had passed away. The passage is seen in his first book, and 28th chapter, *De ratione foci, atque cauterii*—his words are "*licet novissima cura sit.*" (Ed. Manh. p. 45). It appears to have originated with the army with which he would appear to have

been intimately connected, as his work—*De re militari*—would appear to evince. He subsequently queries whether a copper instrument might not be better than an iron one for it. We had one made of this description, intending to try it, but after remaining by us twenty years it got lost or stolen, and we never ventured on another. His expression respecting it is this—“*Sciendum vero Caprina cautera plus effectus ad curandum habere quam ferrea.*” We believe, however, it is the heat imparted to the skin alone that influences its effects, and not at all the metal which does it.

We were present at the first horse ever fired at our veterinary college, and the operation was performed by St. Bel we believe, and may serve us as a sample of its nature, taken from a book of memorandums made by me at the time (for there is no alteration of any consequence since in the mode), when judiciously done. The French call it “*Feu en rayons.*”

The hair was carefully removed by the scissors from the hock to the foot, it being a case of general enlargement and relaxation of all these parts, from severe use apparently. This was done previously to his being cast down. The mucous capsules were stated as being principally concerned, and as being dropsical; but our further experience taught us that these cases belonged rather to an inflammation of the joints, and relaxed capsular ligaments, and sheaths of the tendons generally, than the above parts.

The firing iron, of the usual convex figure, heated a little higher than the low red heat, was drawn lightly down the back sinew posteriorly from the hock downwards, so as only to remove the remaining hair; a similar line was then made on the flat side of the leg. The iron being again heated, the above lines were gone over a second time, and deeper, destroying the cuticle, and producing a distinct white line; and diagonal short lines being then made between these lines, meeting each other in the middle space, and forming, by their concurrence, a pennate or feathered appearance of the whole; these lines were placed about an inch and half asunder, the same was then done on the hock and fetlock, following their direction and figure. He then took an oval pointed iron, and made dots between all the lines. The horse was then turned over, and a similar proceeding pursued with the inside of the limb, and the operation was concluded, and the animal released. I need scarcely say he struggled a good deal. The only art in it is to keep as much straightness in the lines as possible, and to observe an uniformity of depth, without having the necessity of going over them again.

The theory entertained at that time of its effects was, that a new action was induced in the parts (which without doubt it was), and that destroying the old or chronic one, this more active one in subsiding, caused a bracing effect, and an absorption of the relaxed parts, and of their fluid contents. We apprehended also that the skin was diminished, and a tightening assisted in these effects, but on handling the skin subsequently, we afterwards were led to doubt of this diminution of the skin, and that such was not exactly true.

We, in our own practice, have usually, after firing, blistered also; but not till the force of the firing had begun to subside, as in four or five days after, lest there should be a danger of augmenting the inflammation to the extent of making the skin slough off, and disfiguring the limb with unsightly scabs and scars. We think very light firing the best, both for its effects

and the appearances afterwards; and so did one of the best artists in Paris, with whom we conversed on this subject.*

I formerly fired many horses, but at each step grew more and more averse to it, especially extensive and very severe firings, often firing with the hair left on, so as to make the lines, though but superficial, appear the deeper to the eye. I should suppose that one line drawn with a red hot iron along the skin, is, at least, equal in pain to ten cuts of a knife of equal extent. Let any one, who has any doubt of its severity, only touch his own hands or legs with the instrument, and he will then believe it ought not to be lightly or inconsiderately used by any body who should please to resort to it, or thus offend these poor defenceless creatures. How many such lines would be required in firing a horse all four legs! which is not unfrequently done. We should be unwilling unnecessarily to magnify or misrepresent the matter, but the more we reflect on it, the more we feel the necessity of some enactment or regulation among the faculty itself, for some kind of restraint in this respect. For all abhorrent cruelties towards these beneficial creatures will at all times be likely, instead of advancing the estimation of the veterinary art with the public, to retard its reception and favour; that is, as far as it can be done without much detraction from its real benefit and usefulness.

In the racing circles, the horrid spectacle is frequently presented of the young horse that has never done any work being fired, on the mere pretence (which nothing, even if true, could justify), of strengthening them for the race course: a very questionable proceeding indeed as to the fact; but of its shameful cruelty there can be no doubt. We should rather be inclined however, to attribute the suggestion and recommendation of it to those interested in the performance of it, than to the masters who permit it, and whose education ought to teach them better things. It would appear to our shame that the unttaught Arab, almost unacquainted with the mild precepts of the Christian religion, has more of true feeling for his beloved animal than we have, and the testimony of travellers seems fully and disgracefully to confirm the fact.

We believe, neither are we alone in the opinion, for we have heard an excellent horseman, the late Lord Morton, often express the same sentiment, that the worth of a stallion cannot by any means be inferred from his success on the race course; and, in strong confirmation of this sentiment comes the Godolphin Arabian, or Barb rather, which he truly was, who, though no racer himself, became the progenitor of the finest racing stock that ever this country beheld; and some horses are of so high a mettle and generous nature, that they will not race, or try to win at least, if much beaten or ill-treated. Eclipse himself was a remarkable example of this, and no doubt many others, had their deeds and celebrity made them worthy of a particular record.

And it would not be difficult to show that in the ordinary general service of horses, he, who

* We are here inclined to suggest that a very useful kind of firing might be instituted with less cruelty, and sufficient effects, by taking the firing iron out of boiling oil, which is about 400 degrees of heat, and would regulate it, or if rather higher temperature was required, melted lead or tin, or a combination of metals, for accomplishing a greater or less heat, might be used.

by overwork or too straining and severe, damages his horse, also damages himself and his own interests; for the replacing them is vastly too costly not to make it a loss, in most countries at least, and the laming them not less so, from the keep and expenses attending it.

The law formerly made little or no distinction in property between dead and living matter, and "a man might do as he would with his own"; this feudal grossness is now fortunately removed, and cruelty can be punished although with his own. Societies also have been formed for protecting these animals; they however, appear at present of too sickly a character to do much good. Now and then notice is taken of an individual instance of barbarity, and they would punish it, if the tory magistrates would let them; still the great mass of cruelty towards beasts and horses wanting reform, goes unnoticed. The abattoirs of France still continue to shame us as to the first, and the ironing and reducing of horses' feet, as to the latter, although producing the most miserable results to both man and horse, and by which fatal accidents that daily are occurring through it, seem to be quite passed over and disregarded, as though unknown to them.

Returning, however, to our firing. The legs, after being fired, have generally been by us left for a few days quite untouched, for it to have its full effect; if the inflammation should run too high, the affusion of cold water once or twice will stop it; and, about this time, it is usual to lightly blister the parts, and afterwards, to bring off the scabs more easily, the skin may be anointed with any kind of mild grease. It is usual also to tie up their heads for a few days after firing, to prevent their gnawing and injuring themselves. They should, however, be let down as early as possible, if we find on their being watched, when at liberty, that they show no inclination this way, as the tying up night and day is a very heavy punishment superadded to an infliction so severe.

GREASE IN HORSES, a troublesome, fœtid, and painful disorder, by the chaps it occasions to the fetlocks; and, in this country, is of not unfrequent occurrence.

This complaint, so common with us, does not appear to have been by any means so frequent with the ancients, since it hardly obtains any mention in the writings of Vegetius, although a pretty copious writer in other respects. On the continent indeed, according to our observations, made in various visits there, although it certainly occurs, it does not appear with that frequency that it is seen with us. Whether this may proceed from the greater dryness of the air, and the warmer climate of the eastern world, or whether it may proceed from our different manner of treating horses in work, I cannot determine; but the fact appears to me undeniable. A climate naturally more cold and humid, may by some be considered as a sufficient cause, of itself, to account for it; but certain we are, that we have certain practices here, generally with the grooms, that cannot do otherwise than very much contribute to it. Although the ancients appear to have been less troubled with it, on a more attentive inspection however, of the Greek writers on the veterinary art, the complaint is to be found described by them, and

by Absyrtus himself, their leading writer, and which renders it the more remarkable that Vegetius, who largely copies from Absyrtus, should not have noticed it.

The account of it is contained in a letter of his to his friend Apollonoides, whom he styles horse physician (*παιαρῆς*) on certain *depletions, rheums, scirra, or chiramata*, incident to horses.* The last of these, viz. *chiramata*, he expressly tells us the Romans called *saffragines*, by which term they unquestionably meant the fetlock-joint of the horse, and on or below which is truly the seat of this disorder. He afterwards states, there are fissures in the hands of men also, and which are apt to occur in the winter season; and that these were also denominated *chiramata*, and were obviously what we call chilblains. These diseases arise very much from the same cause in both animals, viz. chills and wet applied to the extremities; there is, however, a momentous difference in the nature of the discharge from these clefts, since those of the horse are found, upon pretty clear evidence, to be of a highly poisonous character, and capable of conferring to the teats of the cow the vaccine disease, which, as it has the power of repelling or opposing the access of small pox, must have near affinity with it, and would lead one, naturally enough, to the conclusion, that small pox itself had this discharge for its progenitor somehow generated, under circumstances we shall never know, or by some combination of circumstances in both animals, we may, at this period, in vain try to imitate.

The description given of this complaint by Absyrtus is somewhat general and vague; yet enough to identify it. His remedies, also, are of the same class and tendency as our own at present in use, but vastly more feeble, being derived entirely from the vegetable kingdom. We here incline to give some account of them, as a curiosity, and specimen of ancient pharmacæutic knowledge and practice at this early period.

"Blood," he says, "is to be taken from the bottom of the foot, and from the interior and exterior veins of the hock. From the origin of the hoof," he says, "it is not proper to take it, but from below the hoof, scraping away the horn of the sole, and then lightly scarifying the part, giving opportunity thereby for the noxious humour to escape; afterwards to dress the sore with wine. The juice of the red acacia, rubbed down in water to the consistence of honey, the part is then to be anointed with, or with hogs' lard mixed with tar. Let him be walked about pretty frequently, but in nowise to be wetted with water. It is a complaint appearing more in winter, and which the summer tends to remove. Animals having the *chiramata*, are not so susceptible of the *arthritis*, or joint disease, and geldings also are less susceptible of it."

The following remedies are recommended in this disorder: Meal made from *taves*, mixed up with wine or honey, to be applied about the parts, or, which is better, *bean flour*. *Swine's dung* rubbed down with wine, in which *pomegranate rind* has been boiled, is to be tied round the part; also pounded *gallnuts*. The *dregs* of sour wine made warm is also a salutary application. The roots of *asphodel* boiled in water is also efficacious. Also the fetlocks should be well rubbed with salt, wine, and honey."

Eunelus, in a succeeding chapter, recommends strong vinegar, and afterwards sets down a

* Script. Græci Veterin.-lib. i. M.B. p. 158. Ed. fol. Latine reddita Ruellio, p. 61.

† Without doubt from *sub* and *frango*, in allusion to the break or angle of the limb at this part.

most strange incoherent jumble of things we need not trouble the reader with. Such, we see, was the practice in the days of Constantine, or about the fifth century of the Christian era.

The French use the term *caux de jambes* to this complaint, which conveys too much the idea of a dropsy, with which it has certainly no analogy. Our English name, again, is taken from the unctuous appearance of the discharge, although certainly not at all of a greasy nature, so as to deserve that epithet. The Greeks, with more propriety, made the chaps or fissures the source of their appellation, calling it *chiramata*, which, probably, was only a copying of their expression for chilblains or chapped hands, and will afford us no classical or technical name for professional use. In resorting to the Latin word *suffrago*, the Roman name for the fetlock-joint, we may perhaps get something more to our purpose, instead of carrying on the inappropriate barbarisms at present employed, not admitting of an adjective application, or at all of the inflections of language; we, therefore, with diffidence, as contending on every side with a difficulty, would venture in recommending, rather than go on in error, the appellation *suffritis* to this disorder, derived, as we have already stated, from *sub* and *frango*, or the jointed part, the true seat of the disorder; leaving it, however, open to be superseded by a better, if such should be thought necessary. For express terms, founded in truth, are like good tools to the mechanic, enabling him to solve the business without being led astray by delusive, false, or inappropriate terms.

Of the cause.—We have now to consider the source of this unpleasant disorder. If a horse, especially in the autumn season of the year, be rather highly fed, and then is exposed in his work to wet and dirty roads, and more especially if, on his return home, or at his journey's end, he be exposed by the groom or ostler to drenching, and slopping of his legs and feet with cold water, which afterwards may be very imperfectly removed, the chances are many that his legs will take to swelling, become hot and painful, and, at the end of a few hours, the skin will burst in various parts, and clefts will be formed, issuing a hot greasy-looking discharge, which, if allowed to remain on the parts, will become very fetid. It is the crease or depressed fold immediately under the back of the fetlock, that is the part usually first to rupture.

This disorder we have thought was more brief and frequent in horses of about five or six years old, than at other age, and which we were led to imagine might proceed from their growth, at least upwards, having ceased pretty much at this period of their lives, which caused the blood, or capillary vessels rather, the fabricators of the system, and now less employed to take on more easily inflammatory actions. Added to this, that at five or six years, the horse having acquired his form and stature, his full work was imposed upon him, and, in order to enable him the better to accomplish it, a more generous and liberal allowance, and of stimulating food, was administered to him, thus increasing the blood in an inordinate degree, and disposing him to this and other inflammatory attacks. For the skin damped and chilled, and then, perhaps, heated by the stable, from the inferior position of the parts, the blood returns into them with a double force, and distension of the vessels, and inflammation and swelling, is the consequence, with its attendant effects, such as take place in lung cases and bowel cases under similar chills. It is, however, extraordinary, that an apparent simple inflammatory

affection of the skin, should produce a discharge of a character so peculiarly poisonous and disastrous, such as almost threatened, at one period, to devastate the human race, that is, supposing the small pox to have proceeded from it, of which there can, we believe, be but little doubt.

I have sometimes been almost led to believe that this disease had some affinity or relationship to the farcy in horses, of the poisonous properties of whose discharges we possess abundant proof, since I have seen it alternating with that complaint, one appearing as the other disappeared, the suppression of the one constantly producing the appearance of the other, so that the grease may be but one of the forms of that Proteus disease; and, in obstinate cases, therefore, of grease, I have resorted successfully to the medicines that we have found so efficacious in that disease.

These chaps or clefts in the fetlocks of the horse, if left to themselves and neglected, will at length poison the whole surrounding connected skin, and thicken it, and cause large warty excrescences to rise on its surface with great inveteracy, and the disease then assumes, vulgarly, the name of *the grapes*.

Of the cure.—One essential indication, or object rather, seems to be, to keep the parts as clean and warm as we can, and in the early stages of it, to *bleed, purge*, and use *emollients* locally; afterwards we may employ aromatics and tonics internally, and astringents topically, using assiduous care that these topical remedies reach to the very bottom of the clefts or cracks in the skin, which are deep, otherwise uncertain will be their effects.

The following case occurs in my note-book of a coach-horse that had this complaint, which had resisted more than a twelvemonth all the nostrums of the coachman, and of his friend at the forge:

A favourite coach-horse belonging to J. P. D., Esq., had the back parts of the pastern badly chapped, the chaps extending to the side cartilages, and to the skin above the inflexions, which was broken in chaps, thickened and hardened at their edges, by the long continuance of the disease. I ordered a gentle dose of aloes, some egyptiac to the chaps, and to clothe the parts with a large square piece of chamoy leather or skin, such as they use for cleaning plate with, lapped about the posteriors of the pastern and hoof, and fastened in front by ties or straps and buckles, to be worn in the stable, and one coloured red, he being a bay horse, to be used out of doors, in order to quicken the languid circulation of the parts, and stimulate to more healthy actions. I ordered, also, after the operation of the laxative, some tonic cordial powders, consisting each of five grains of finely-powdered cantharides, four sulphate of zinc, eight grains of powdered tumeric-root, ten grains of powdered pimento berry, rubbed together with a dram of sifted barley meal as a diluent, one to be administered every morning in his corn. The effect of this treatment was remarkable, for, in about ten days, all the chaps, which had extended into the very bulbs at the back of the inflexion, were healed. I ordered, however, for safety, the continuance of the chamoy leather for a week or two after, and a little stiff mild ointment, to encourage the formation of hair, and keep it growing in a right direction.

I am not assured, not having witnessed its effects, after a horse has been much exposed in his work to dirty wet roads, and on coming into the stable, being well cleaned and perfectly

dried, if we were to employ a dressing of some mild ointment to the bend of the fetlock, such as a little lard or fat, might not be of useful service in preventing the skin inflaming and cracking.

In recent cases, warm, and sufficiently large, poultices of bran, softened with linseed meal, are useful for some days before the astringents are applied. My friend Samuel Bloxham, of the Life Guards, informed me he often succeeded in healing a chap behind the fetlock, with tying on a poultice made of oatmeal, and strewed over with alum in powder, on the surface presented to the sore, leaving it on till the parts healed.

Grapey heels would require greater care, and daily washing and cleanliness, and a more frequent application of the remedies, to bring the skin into its natural tone and elasticity again, in which the use of lard or tallow might for some time be required, and used also for some time after the cure has been accomplished. Urine balls have been much recommended by some in this complaint; we think, however, one dose of the aloes of more effect than many of these.

The complaint called *malenders*, occurring in the bend of the knee, appears very much of this description, and yields to the same remedies. And the *sallenders*, appearing in the flexure of the hock behind, is also of the same family, and yields to a similar treatment, unless there exists in the habit an inveterate disposition to farcy, when these cases must be undertaken and treated as in a regular attack of that disorder.*

The low position of the hind legs, owing to a too rapid declension of the stall, has a great influence on this complaint. I have seen a horse cured by only reversing every day his position in the stall: this should, therefore, be kept ever in view. Thick-legged and thick-skinned horses also are apprehended more subject to this disease, than thin-skinned ones and less hairy. This may be true, and assuredly the former are with more difficulty made dry after being wetted, which may in part account for it. If *egyptiac* be not at hand, a solution of sulphate of zinc is not a bad substitute for it, and is in some cases, more directly efficacious. In the healing of these chaps there is sometimes a horny ridge formed in the skin, which is thought by some indicative of a poisonous sore. The greasy appearance of the discharge, probably arises from a disturbed or changed coagulable lymph. In old cases the legs become œdematous after the cure, which is best removed by bandages of calico, physic, exercise, and rubbing with hay bands. Poultices alone we have found quite adequate to the removal of the disease, if perseveringly used, without any astringents whatever; indeed, warmth seems a leading feature in the cure. Corn, and especially beans, in large quantities, will reproduce its appearance, whilst grass seems to diminish its access, and to cure it. The lymphatics of the legs get disordered by the discharge sometimes, and the point on the skin, where their mouth terminates externally, forms a kind of small ulcer, and sometimes occasions a sinus up the leg in the course of the absorbent.

To prevent the chaps from getting too dry and bleeding, if the horse be used in his work, it is

* We are led to conjecture that this singular epithet is derived from old French, viz. *mal en torse*, meaning *evil in the bend*,--that is, of the back or bend of the knee; hence also the word *Torso* became applied to the bent or stooping Hercules. The *sallenders* also appears derived from *sale*, that is, foul or dirty, *en torse*, in the flexure or bend of the hock.

well to anoint the edges of the sores with tallow or lard before he goes out, especially if the parts are uncovered, in order to supple the skin and new-formed cicatrix in the angle of the chap from being rent open, and frustrating its healing. I have witnessed in stables, that a good supply of wholesome food kept the horses free from it, accompanied, perhaps, as that nearly always is, with great attention and cleanliness in keeping their legs dry, and clean, and warm; whilst low diet and ill feeding, attended, as it generally is, with neglect and carelessness, subjects them to the disorder.

This complaint, when it has invaded the legs, and continued for some time under bad, and perhaps severe, applications, the animal becomes impatient and vicious, in having his legs touched or handled, which occasions a further neglect, and much increases the difficulty of cure; therefore, early attention to these cases is best, when, in general, there is not much difficulty in removing it. If an animal has been kept very low and ill-fed, good feeding and proper exercise seems to assist the cure; but much heating food, with insufficient exercise, certainly will increase it. The green herb or grass in these cases will much assist, by its cooling properties on the system, in the cure. There appears to be a singular laxity in the skin proceeding from the fetlock-joint posteriorly, to the foot; and this skin seems also of a denser, thicker nature than in the rest of the limb. It would appear to be so given, to admit of a free and full extension when the horse is in rapid and violent action, and then the pressure on the limb is so great that these parts are carried far forward, and are demanding a great extension of the skin to follow them, and of strength also to prevent its rupture and injury; hence would appear, combined with an increased warmth, from the density of it, the cause of this peculiar make. In this complaint there appears to be distinct evidence of a poison self-generated in the animal, and not derived from any contagion or infection, as such had been formerly denied by physiologists of eminence.

Though there appears to be an alliance between farcy and this disorder, yet we never observed the discharges in farcy to assume the very foetid character of this complaint; and the chaps again, are very unlike the buds and ulcerations the farcy produces. Where the skin is much distended, weak, and without tone or power, it is well, after reversing the position in the stall in the way we have recommended, to resort to calico bandages, to assist the relaxed and overcharged vessels, and to use friction with soft hay-bands we should believe to be beneficial.

THE CHOLERA UNMASKED;

OR,

ITS TRUE NAME, NATURE, AND CAUSES POINTED OUT;

ALSO

A MORE CONSISTENT AND SUCCESSFUL MODE OF TREATING IT.

BY BRACY CLARK, F.L.S.,

Member of the Royal Institute of France, &c.

CORRECTED FROM A COMMUNICATION FORMERLY ADDRESSED TO THE EDITORS
OF THE MEDICAL GAZETTE.

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In the midst of the numerous, opposite, and very conflicting opinions which prevail at this time respecting the direful epidemic called cholera, permit me to address you, as this disease still exerts its fatal ravages in spite of all that has been done, and the opinions respecting its nature and its treatment seem to be almost as various and unsettled now as they were at the commencement of it, if we may judge, at least, from the recommendations every day proposed in the medical periodicals.

Under these circumstances you will, perhaps, pardon the suggestions of one who, though formerly educated for it, is not now strictly one of your honourable profession, and allow him to advance an opinion which he has long entertained, and which, if it be not founded in truth, has one merit at least—that of novelty. These views have, however, been shown to a few of his medical acquaintance, who do not see any thing in them to forbid the reasonings and conclusions here drawn, which has induced him, with great deference however, to make them more publicly known. If they should be admitted, they will certainly lead to a more decisive, and perhaps more successful mode of treating this deplorable malady.

Many physicians having observed that there was often a great deficiency of bile in the intestines after death, were led into a state of doubt whether this dreadful epidemic, although designated *Cholera morbus*, was, in reality, that fatal disease, since medical books everywhere proclaimed it as of a most highly bilious character, whilst the disorder appeared very commonly entirely deficient in that essential respect. It is, however, as we shall presently see, the genuine *Cholera morbus* of the physicians, but which had been strangely, for ages, even from the times of the Roman, Celsus, described as a disease of dreadfully bilious origin, and which opinion continued down to our own times, even with physicians the most eminent and by the highest medical authorities; as in the historical or second part of our dissertation we shall presently exhibit

from passages deduced from them. It would appear, indeed, that this truly excellent man and physician, Celsus, living in times when liver complaints, perhaps from gross and voluptuous habits among the Romans, strongly prevailed in the Roman states, and attracted an unusual degree of attention to it, and caused them to regard these disorders as of an high atrabiliary distemperament, and Celsus giving it this character in a striking degree, led succeeding physicians, seduced by so great an authority, into this egregious error.

The violent purgings, also, that often assailed the patient in this disease, caused it to be mistaken, at other times, for a diarrhæous complaint; but still as proceeding from a redundant bile, both of which opinions we shall see to have had no solid foundation in truth. Its true diagnostic symptom we propose to point out, and which will much serve to simplify our view and understanding of this dread malady; for the purging and the bile called in so unnecessarily to explain the nature of the disorder, have only served to throw an almost impenetrable veil over it, and to render it unintelligible: and thousands of valuable lives, we believe, might have been saved, had these views, we are about to give, been more early seen and adopted and acted upon.

Perusing the various descriptions of this disorder, as well in England as on the Continent, I have been a long time firmly persuaded that its prevailing character bore a nearer analogy to a complaint that I had had often to contend with among animals, than to any enumerated in the books on human nosology; and that, in fact, it was a more or less complete suppression of the process of digestion or chylification, as we shall presently illustrate by actual cases, and that it bore a closer resemblance to, and was proceeding from, very much the same fatal causes as the *Strophos*, or the *Gripes*, of horses; in which complaint, in the early part of my practice in this great metropolis, I had had a large and not unsuccessful experience, having discovered its true cause, and a mode of combating it, that generally gave a favourable result.

Attacks of this complaint, like the cholera, often carried off the animal in a few hours; and in the commencement of my practice, though employing and using all the then known and recommended remedies, (and such are sure to be numerous and discordant enough, where the character of the disease and its treatment are not understood,) I frequently lost my patients. Fearful of losing my credit also, I took unusual pains, by watching, dissection, and otherwise, in satisfying myself of the nature of the disease, and of what should be its proper treatment, and at length so far succeeded, that for years I never lost a patient, though often contending with protracted and cruel cases. The success that attended my treatment induced me, for a considerable period, to keep the remedy a secret, and it was extensively sold privately; but, at length becoming more generally known, and abused also, and not given with the laws prescribed with it, I determined on publishing an account of it, and (what was of fully as much or more consequence) my views respecting the nature and causes of the complaint itself, and how it should be treated by properly sustained measures in aid of the medicine.—(See "*Essay on the Gripes of Horses*," London, 1816.)—I believe, in the different large breweries in this metropolis that I at that time attended, some thousand pounds worth of horses were saved by

this medicine and what I called a duly-sustained treatment of the complaint, and of which, testimonies were given me, which appear at the end of the above treatise.

In respect to the cause of the disease, I traced it satisfactorily, at its commencement, to an insufficient power in the alimentary organs to carry on and perfect the digestive process, either from the accession of some debilitating cause, which rendered these organs unequal to the task, or from the unfavourable nature of the contents of the viscera as to quality or quantity, or from both or all the above causes combined. The lowering agency of a sudden chill to the abdomen would alone produce it under ordinary circumstances, and still more easily if a refractory quality or unusual quantity was superadded. Derangement or entire suppression of the chylifacient process taking place in the intestines, the disease would be carried on there to its termination in death; or it might be communicated by sympathy or by connexion to the stomach, or *vice versâ*, beginning in the stomach, it might be carried to the bowels. In either case the suppression or arrestation of the digestive process would quickly produce *tormina*, which, if not relieved by the restoration of the digestion, would quickly terminate in death, either by inflaming the mucous membrane of the bowels or stomach, or by its operation upon the brain through the agency of the nerves of the stomach. In horses, who could withstand a severer shock of this sort than the more sensitive human being, inflammation would have time to establish itself pretty fully in the membranes of the bowels, and produce appearances not very unlike what Dr. Annesley has given in his work on Indian Cholera, on an athletic race of British soldiers; for extreme violence in the attack from several causes combined, with great strength of constitution to resist it, would have much the same effect in the animal as often happened in the severe and protracted cases related in India.

We may, perhaps, illustrate the cause of the sudden termination of the complaint in the following way:—that many substances assume a poisonous quality if they are not digested; but if digested they are perfectly inert.

If you give to a horse four ounces of the leaves of the yew tree, on an empty stomach, it will destroy him in a few hours, and but a very slight appearance of inflammation will the stomach exhibit, in bright petechiæ, or spots of the size of the little finger nail. But if to this quantity of the acrid vegetable you add eight ounces of oats, and mix them together, he will eat the whole, will digest them well, and will not even be incommoded: so that in the former case he must have been destroyed by the influence of the undigested matter upon the brain, acting upon the nerves of the stomach before the other symptoms attending the suppressed act could have had time to display themselves.

It may be asked, what should be the cause of this epidemic at this particular time, and why it should be almost wholly, if not quite, a human one? This I would not undertake to account for, any more than for the plagues in Egypt or Jerusalem, or the causes of any other scourges with which the Almighty at times has assuredly visited mankind. I can however, in reply to it, only just observe, that if the atmosphere was, by any changes in it, rendered less stimu-

lant to the ordinary act of human digestion, it would readily produce such an effect; nor could we, perhaps, by any analysis detect the cause, though it is possible that we might, if truly, anxiously, and industriously employed upon it. That the atmosphere, for a long time past, has been more thick, turbid, and hazy, than I ever remember it before, I can from frequent observation testify; but whether this appearance did or did not belong to the production of the disease, I do not undertake to determine, though I fully believe so: admitting, however, but for a moment the position, we should then see that the naturally weak, the debilitated from intemperance, the glutton, the drunkard, the imprudent, the exposed and the destitute, would be the especial objects of its visitation; as, in fact, they have been amongst its most frequent victims. General Diebitsch was a remarkable instance of it, being a wholesale devourer of punch.

No better account has ever yet been given of the immediate cause of many a pestilence, many a fever and plague, and for which we can only present as a cause, the inexplicable general term *malaria*, or the Almighty will, and no further yet have the profoundest researchers into primary causes been able to get.

One of the best related cases I have seen of the cholera, and most minutely detailed, was that of a gentleman at or near Glasgow, I think, who had eaten an unusually hearty meal of pickled salmon, being fond of it. The mass was too considerable, either from the quantity itself, or the debilitating influences of the malaria, or both, for it to pass through the usual stages of chylicification; he was seized with what were called the genuine symptoms of cholera, which no one ever disputed they were, and he died. Now all the circumstances here could be readily explained upon those principles which I have laid down in explaining the gripes of horses; but there, in some of the most violent and rapid cases in their termination, we had a direct and visible cause in a chilling atmosphere with or without rain, and the animal also sweating from labour at the time of its application, and thus doubling the chill and susceptibility; so that any peculiarity in the atmosphere, more than its being a cold north-easter, was not found to be necessary to its production. The magnitude of the intestines of the horse—the prodigious mass they would contain of vegetable food, least liable of any to digestion—the thin membranes composing them, and the vast abdominal surface exposed to the atmospheric influence, it was that rendered them quite unequal to the task of carrying on the digestive process under such untoward circumstances; and digestion ceasing, *tormina* succeeded, and the disorder once begun, led to others producing active inflammation in the mucous membrane, brain affections, &c.

Now what has been said most to produce this cholera, was the eating of cucumbers and melons, and unripe fruits, and bad pork, and hard meats—and why? because these are amongst the most difficult of the vegetable and animal substances of digestion, and, refusing digestion, they become poisonous, and so do they act in producing *tormina*, knotting of the abdomen, and writhing; and from whence the ancients very naturally called it *Strophos*, from the verb *strepheo*, to turn, twist, or writhe about. And may we not also

readily account for the extraordinary coldness of the tongue, the coldness, lax, and corrugated appearance of the skin, so often noticed, on these principles, from the well-known sympathy of those parts with the stomach, and from its chilled, rigid, and enfeebled state, and the total absence of digestive power, the blood then retiring from these to other parts of the body, as the vena cava, and large vessels of the heart.

In respect to the cure, which all will be desirous to know, it consists only in well-known remedies; but their operation will be rendered more effectual by understanding the true nature of the disease, and the point to be obtained, viz., *the restoration of the digestive function at all events*; for before I found this, I rested when the remedy had been given, nor knew what to do if it did not succeed or take effect, my practice having been then almost purely empirical; but if the train of operations in the stomach and bowels were not restored at one dose, I resorted immediately to a repetition, regardless of the terrors about inflammation (a bugbear which former idle apprehensions had filled me with), by a third, a fourth, or a fifth, pursuing it without delay, and by other measures externally, also nearly as potent, till I saw the healthy actions return, or a recommencement of the digestive process, which being sustained by prudent measures, the case did well. If inflammation had begun, some slight after-treatment might be necessary.

With the horses, I led them to a warm place, immediately shut the doors and windows, covered them with rugs, threw down straw for them to roll upon, and gave them successive doses of the *Tincture of Pimento*, about a quarter of a pint at a dose, waiting half or three quarters of an hour between every dose. Getting my hands under the rugs, I rubbed the abdomen with flannel; and sometimes, with all this, it took seven hours, in very bad cases, to restore the digestive process; but many a one supposed to be dead recovered; for the relief is so great and soothing to them after the excruciating agony they had just suffered, that they dose often on losing their pain, or sleep as though really dead.

I will now relate a human case and its treatment. A very respectable middle-aged woman, in service, not far from my house, had eaten a free, but not very copious, dinner of liver and bacon, and, I believe, had taken porter instead of water with it. She dressed and went out in the afternoon, with a friend, to the Bazaar in St. James's Street, and loitering about to look at the various articles, and a wind blowing through the avenues of the building at the time, she suddenly became uneasy, and soon in violent pain. She returned home as fast as she could, and complained very much of sickness, and a deep, oppressed, painful feeling about the præcordia. She vomited violently, but this did not relieve her pain, which became excruciating. I then ordered her to shut the door of the apartment she was in, and to put the kettle on, with a pint of water—this small quantity only, that it might the sooner be heated; and of this, when nearly boiling, I made her drink, as hot she could in any way get it down, three parts of a pint; her vomiting continued, however, and her pain; and she has since informed me, which I had not paid much attention to at the time, that she had violent spasmodic cramps or pains in the calves of

her legs. I next, therefore, ordered half a pint of hot ginger tea, which she also took, but without relief. About an hour had passed over in this way, still in severe pain. I now ordered her to bed, sending with her a good pan of hot coals to warm it well first; and to this I added a glass of hot gin and water, a little sweetened, which she sipped as hot as she could take it. In less than five minutes after she felt a sudden remission of the pain; she slept well after, and the next morning was at her work as usual. She seemed, however, head-achy towards the afternoon and I recommended a dose of Glauber and Epsom salts mixed, which restored her usual health.

A few days ago, a gentleman of my acquaintance, whose son was not unacquainted with my opinions respecting this complaint, was suddenly seized one evening with excruciating pains about the præcordia, and unlike any thing, in point of severity, he had ever experienced before; he compared it to being screwed through with a screw. A fire was made in his room, and brandy and water pretty strong, with laudanum (which I do not recommend), was given him by his son; and at the end of two hours, by these remedies, and with rubbing the abdomen with flannel, he was relieved, and was out the next day on his morning walk, when I saw him and heard his description of what he had gone through; and his son related to me what he had done for him.

I consider myself as having been twice attacked with an arrested digestive process, and which, if permitted only a short time to have gone on, would have ended in what is called a true cholera (for names, though apparently simple, are frightful things often in misleading our views). I immediately closed the apartment, took to drinking hot water (as hot as I could get it down); I sat by the fire and rubbed, with a flannel bag over the hand, the abdomen, and in a quarter of an hour had dispelled the symptoms. This is the simplest form perhaps of the complaint, or rather the point of commencement of it, when it can be more easily subdued—especially if there be no great opposition from the mass of food, or from its quality not being of a very refractory nature, and the animal powers in tolerable force. The knotted state of the abdomen appears to arise from the *recti* and other abdominal muscles being contracted in sympathy with the suffering parts beneath. For some remarkable cases, where the restoration in the horse was opposed by a combination of untoward circumstances, I must particularly refer the reader to the treatise above described, and for a great deal of reasoning and observation which would be out of place in this small sketch.

As to anodynes or opiates, it must be obvious, relieving pain by mere soothing and lulling the nerves must be nugatory while the causes of that pain remained uncontrolled: I, therefore, early quitted the use of them, and found, by doing without them, their total uselessness; and as bleeding may exhaust the very powers we want to rouse, that also I never resorted to till the next day, if any inflammatory symptoms appeared to remain from the lateness of the remedy or from the extensive application of it, when a gentle purgative or a venesection was decisive.

There may be cases, though I believe but rarely, where the *cordiac* system (or heart, arteries, and veins) may be oppressed by an overcharge of blood,

as in some plethoric people, where *breathing a vein* would set the springs more at liberty for motion, and be of service; otherwise blood-letting I believe not to be necessary, unless to suppress, as we have stated, any inflammation consequent upon the remedy, or that may have arisen from its late application.

After this manner may be successfully treated, we believe, a very great number of these strophic attacks, if for once we may be allowed to drop the erroneous term cholera, for there is certainly no $\chi\omicron\lambda\eta$ or bile to characterise the complaint, or concerned in it; but rather, perhaps, a want or suppression of this secretion; and which want of this important daily purgative of life it is which adds to the facility of the access, and the severity, perhaps, also of the complaint: and may not the diarrhœa, complained of in so many cases as preceding the complaint, derive its origin from the want of the stimulation of this natural fluid? the intestines really inflaming from the want of its usual operation upon them—and thus inducing a capillary arterial flow into them and a purging—for the same causes that suppress the digestive act, will also, it is probable, tend to diminish biliary secretion.

Though by no means generally, yet in several instances we have of late observed that the remedies proposed were of the description here pointed out. Horseradish tea has been given at Ely, in Cambridgeshire, and a cholera tincture is now sold in the shops; but in the manner of using them, there does not seem to be a full understanding of the true nature of the disease, which they continue to call cholera; nor do they appear to be aware of the necessity of making their treatment efficient by a combined plan of operations in the attacking it; so that their treatment is almost an empirical one, and would not, in this case, be attended with nearly so extensive a success.

A few additional remarks, which tend to confirm the identity of Cholera with the Gripes of Horses.

In the treatise above referred to on the Gripes of Horses, we have shown from observations made more than thirty years ago, that the atmospheric influence was alone sufficient for the production of this fatal disorder in the horse, and that a loaded stomach, especially of undigestible food, or from its having been too hastily eaten or ill chewed, or even without these attentions, would, if a chilling atmosphere prevailed, and especially if accompanied with draughts of air or of dampness or rain, become fully adequate to the production of the disease. And we now learn, from the accurate observations of certain French writers, that such causes or agents were actively present on the occasion of the cholera first breaking out in Paris. These relate that for many days previous to its appearance, the heat or temperature of the atmosphere about the middle of the day was considerably greater than usually attended that season of the year, but that during the evenings, the nights, and mornings, there prevailed a strong chilling wind, *blowing from the north-east*, which, after continuing some time, shifted suddenly to the north-west, (which in all probability brought relaxing vapours and dampness in abundance), and immediately upon this change did the cholera commence its ravages in the most formidable way in the metropolis,

carrying off many thousands in the course of a week. See Gendrin, *Monographie du Cholera Morbus*. Also Bouillard, *Traité pratique du Cholera Morbus*). So that perhaps is here exposed all the machinery necessary for the perfect production of so terrible a visitation; but whether any other cause were superadded, that our analytical knowledge does not extend to, is only known to Him who can say,

“necessity or chance
Approach not me, and what I will is fate.”

and who can point the pestilence at his pleasure, in a way inscrutable to us poor mortals.

We shall again advert to the proposition recommended in the foregoing communication, as to the administration of salts in the diarrhoea, or purging, which at times precedes the access of this disorder. It would perhaps appear to some a strange anomaly of prescription to give salts to a person already labouring under a diarrhoea: their efficacy, however, I can from much experience speak of in respect to horses in arresting a super-purgation (see *Pharmacopœia Equina*, p. 32), and there are practitioners who have confirmed the fact of their utility in this way in the human. It may appear unnecessary, or presumptuous in me, to attempt an explanation of their operation, or I should be induced to observe that they can operate in three ways in producing so favourable a result: 1st, by inducing a new and different action to those already going on in the stomach and intestines; 2dly, by the alkaline and sulphurous properties of the salts themselves, in correcting any acrescent or acrimonious quality in the fluid contents of these organs; and finally, and perhaps most efficiently of all, by causing a flow of healthy bile into the intestines, where there had previously been a deficient quantity, or a total suppression of that very necessary stimulant to due intestinal performance.*

In respect to the case of cholera above related, we advert to it again just to state, that had it not yielded to the combined effects of the hot water, hot ginger tea, hot bed, and hot gin and water, we should have pursued our course by still stronger measures—with brandy and water, and with the *Gripetincture*, which is brandy, or proof spirit and aromatics or spices: see the above Treatise on Gripes, p. 10.

Some of my readers of the above communication have demanded further proof of food not digested assuming poisonous qualities. In reply to this demand I have noticed to them the effects which shell-fish sometimes produce. The most notorious of these is the Muscle, which eaten hastily, or without the priming of some stimulating agent, as pepper, salt, or vinegar, or eaten in too great quantity, will refuse digestion, and all the phenomena of poisoning be exhibited: so much so, that those called in to the case have often declared that it was a true case of poisoning, and by copper, and that these animals must have lain upon, or eaten copper, and as coming from some coppered vessel that had been stranded! So that, to fulfil this theory of poisoning by copper,

* That the salts produce their effect by inducing a flow of the bile into the intestines from the gall bladder, for we have found, on continuing them for several days, that they cease to have the same effect, apparently from the gall bladder becoming exhausted.

PART II.

OF A

DISSERTATION ON THE EPIDEMIC CHOLERA.

IN the preceding part, or memoir, I endeavoured to consider the true origin and nature of this disease, and why at times it assumed such a very sudden and fatal termination, viz., from the undigested mass acquiring a poisonous character. This also would explain the cause of the furious riots in Paris and St. Petersburg on the first breaking out of the epidemic, the populace conceiving that they were poisoned by the doctors, and also by the vintners, many of whom nearly lost their lives through this suspicion.

And we also endeavoured to explain why at other times, as in the more protracted cases, without actually destroying the patient at once, it produced effects on the nervous system, such as gave to it very much the appearance of a low nervous fever, or typhus. To these remarks were added what we conceived to be the genuine principles for its treatment, by recalling, by every possible means combined, the restoration of the impaired or lost digestive and chylopoietic functions.

In the present memoir, it is proposed to inquire into the antiquity and original signification of the term *Cholera*, and to examine the views and opinions of those physicians who followed immediately after the ancients, and from whom we have principally derived our present erroneous views of the disease, and then those of our modern physicians, and to conclude by giving to the disease a new name and arrangement in the medical system.

Desirous of ascertaining more exactly the origin of the term *Cholera* among the ancients, and the sense in which they employed it, and how these erroneous notions of the bilious nature of this complaint first originated, I was led, in order to pursue these researches, to avail myself of the two noble medical libraries in Lincoln's-inn-fields, that of the College of Surgeons, and that of the Medico-Chirurgical Society, and I acknowledge with pleasure my having received the most polite attention and satisfactory aid from the two respective librarians having the care of these valuable collections.

As far back as Hippocrates, the word *cholera* is found, it several times occurring in his works, and always standing by itself, and without the modern adjunct of *morbus* attached to it. It is therefore of very remote antiquity, but in his descriptions of the disease he does not appear particularly to refer it to a bilious origin, neither does he appear to have ever seen it in the character of a terrible epidemic, such as it has appeared of late years in India and in Europe.

Before Hippocrates, however, Erasistratus describes the disorder, and without appearing particularly to insist on its bilious origin or character.

But the word *cholera* is to be found long antecedent to both the above writers, and at a period nearly coeval with the earliest graphic records. It occurs several times in the original Hebrew of the sacred writings, and as early as the books of the Pentateuch of Moses. In the Hebrew the word is often divided into two, חולי *choli* and רא *ra*; sometimes, however, united. According to the Hebraists, *choli* simply signifies illness, sickness, inflictive disease, or plague, without any reference to, or as being in any manner derived from, bile in particular. They inform us also that the additional *ra* signifies that the said infliction or disease was in an excessive or superlative degree. We subjoin the references to all those passages where the term is said to be found, as well in the writings of Moses as in the other parts of the Scriptures, that any one more deeply versed in the study of Hebrew, than we profess to be, may have the opportunity of fully considering the true meaning and sense in which they have been employed. These passages, we ought also in justice to state, appear to have been first collected and observed by a gentleman of the Cambridge University, E. H. Smith, Esq. Deut. xxviii. ver 59, vii. 15; 2 Chron. xxi. 15; 1 Kings xvii. 17; and others.

And *choli* is from *chala* he was sick or sickened, from the preter perfect tense of the verb *chala* to be sick or ill, used also for nervous tremor of the bowels such as attends an irresistibly violent colliquative sickness. And what appears singular is that *Misrahim* appears to have been the Hebrew Vernacular or ancient native name of Egypt.

Here it is pretty clear and evident, that in this very ancient use of the term *choli*, it had no relation to the liver or any of its secretions, but did merely indicate a dire disease, or infliction. And may it be otherwise than fair to conclude, that as Moses was said to be "skilled in all the learning of the Egyptians," and was an Egyptian by birth, that he derived the very term from this extraordinary people, and is it not also as fair to conclude that the Greeks obtained it from the very same source, or rather from the Hebrews, and for reasons we shall see hereafter.

For it may be worthy of remark, as a singular fact, that two words so nearly allied as the Hebrew *choli*, and the Greek *χολη* in which, in pronunciation, there is hardly a difference, should have had such very different significations, when used by two neighbouring states or nations; and that one should signify disease only, whilst the other should signify bile only, since the Greeks appear to have had no other phrase for this secretion. It is therefore but reasonable to conclude that this would give them a bias towards considering it a bilious disease, not easy to disembarass themselves of, and in a still greater degree would be this bias in those who consulted the Greek physicians and learnt their language and their arts exteriorly, and such we shall see has been the general bias of nearly all European physicians.

The additional *ra* alone serves to distinguish this term from the expression for bile, *χολη* and as *ra* would signify nothing in the Greek if so added, but is of powerful effect in the Hebrew, it must be clear that it is of Hebrew or Egyptian origin.

This word *ra* seems to be a word of a singular description and power, and of most extensive and important application, always meaning something strong and powerful added to or preceding words *Colera* would seem to have signified a strong or powerful bilious affection, the *Ra* added to Eastern names seems to confer power and nobility, as the *Rajah* of Travancore &c. following the name it also has the same important effect as, *Elmira*, and perhaps *Palmira*? perhaps sometimes pronounced softly as *c*, by which we get *re* the king, and *rego* that is to say *re Ego I the king*, and hence *rego*, *regi* we obtain the term *Rea*, and *regnum* a Kingdom, &c. and *Israel* powerful in the Lord—*Rechab* i.e. *abre* descended from the King? *Rehoboam* having the life of the King.—[In the British Museum of Egyptian antiquities is a hawk headed rod, under it stands the God *ra*? Gallery of antiquities, p. 261, Ed. 1839.] our English word *raw* pronounced broad as denoting anything very repulsive, unfit, or uncouth, may have had its origin also in this Eastern source.

We shall now see these remarks in a singular manner verified on referring to Celsus, who followed those early Greek physicians above noticed, at no very distant period and here we find him ascribing to cholera directly a bilious origin, and supporting the opinion apparently by his own observations on the disease. I cannot any where find, however, the quotation of Dr. Mason Good, who tells us that Celsus derived cholera from *χολη* bile, and *ρῶ* to flow, for no such derivation occurs with him: Celsus probably knew better. This is another instance of false quotation, showing how necessary it is to examine quotations, and not to take them on trust, for this passage has been lately often repeated by others. The real words of Celsus are well worth remarking, and are as follows:—"Nam simul et dejectio, et vomitus est; præterque hæc, inflatio est, intestina torquentur, bilis supra infraque erumpit, primum aquæ similis. deinde ut in ea recens caro lota esse videatur, interdum tibia, nonnunquam nigra, vel varia. Ergo eo nomine morbum nunc *χολέρα* Græci nominantur." Celsus, lib. 4. c. xi.

Here we see that Celsus fully falls into the idea of a dreadfully bilious disease, and to confirm his apprehensions, this excellent man is led to imagine that the bile can assume nearly all colours and forms, and as being "sometimes limpid as water, sometimes in lumps like parboiled bits of flesh, sometimes, white, and sometimes black, or various." In the cure, however, he recommends warm water, as we do, but seems to defer spices and wines till towards the conclusion of the disorder!

The physicians, after the time of Celsus following his example, more and more embraced, almost invariably, the notion of a bilious origin to this complaint, and not from a suppression, which is generally the fact, but from a redundancy of the bile. Yet very numerous accurately-conducted dissections of late have convincingly proved the contrary to be the case, by the fullness of the gall-bladder itself, and from the dark colour of the retained bile. Hence I was led in an early part of my former communication to say, that either the disease was wrongfully referred to, or the name of it, implying bile or as of bilious origin, was a misnomer, and such proves now to be the fact, and we must go back to the simple Hebrew sense of the word to justify the name at all.

It is, however, possible that a very contrary state, viz., a suppression of the bile, may so derange the health as to render a person more obnoxious to the disease, or predispose him to receive it; though even

then the disease must be proximately or primarily induced by certain conditions of the stomach, as to food and of the atmosphere, as to chill or damp fully to induce the access. For that cannot at least, in any proper sense of the term, be called a bilious disease, where this secretion, instead of abounding, is deficient or rendered difficult. In what sense the ancient Egyptians employed the term it would be now hard to discover, but it is fair to conjecture perhaps in the same simple sense that we find it with the Hebrews; as a pestilence of whose origin they knew nothing.

Having in some degree corrected the terms used, and estimated their proper value, we may now more safely venture to consider, and more usefully also, some of the less ancient writings of physicians upon this complaint, and from these pass to the modern writers, proposing a new name afterwards more expressive of the nature of the disease.

Before, however, I quit this part of the subject, I could desire just to remark that during my stay in Germany about two years ago, and with this complaint raging all around me, I observed that the Germans pronounced the word cholera very differently to what we do in England, pronouncing the *e* long, *Choëra*, instead of short, as we do, *Cholëra*. Whether it may serve to guide us I do not undertake to determine, but the Greeks certainly spelt it with an eta (*η*) or *e* long, and, I should therefore be led to believe this ought to be the normal pronunciation of it, and that it was so pronounced by the Eastern nations, from which the Germans are more likely, from their actual locality, to have received it, than ourselves. It is singular, however, and worthy of notice, that in the foregoing quotation from Celsus, we see it spelt with an epsilon gravely accented, and not as we find it in the Greek writers generally written, which may perhaps be explained from the frequent transcriptions by the Romans, and by scribes who knew not Greek, and had no letter in their alphabet corresponding to the eta or *e* long.

Encouraged by the opportunity these splendid libraries afforded me, I thought it well also just to examine respecting the opinions of some of those physicians who succeeded at some distance those ancients we have lately spoken of. *Alexander Trallianus* was one of these, and appears to have lived about the reign of the Emperor Julian, the Apostate, and was by birth a Syrian, writing in his native tongue: his works were translated into Greek, and afterwards published with a latin version, by the industrious Germans at Andernach. He appears to have regarded the Diarrhoea, which sometimes attended this complaint, as not particularly proceeding from bilious discharges; and he appears also to have entertained very just views of the complaint itself, ascribing it to indigestion and to chills, and recommending warm clothing and warm spicy medicaments; hence his practice must have been eminently successful. Neither does he make much mention of bile in it; in one part of it indeed its presence in the organs of digestion is expressly denied by him. *Edit. Andernachie Rhenensis*, lib. vii. cap. 14.

Curtius Aurelianus, De Acutis Morbis, lib. ii. cap. 19, is under great difficulties as to the origin of the word Cholera, but throws no new light upon the subject, and most fully supposes it the consequence of a redundancy of the bile, and all his reasonings are full of those imaginations which such a doctrine naturally leads to, and are hardly worthy a repetition here.

Aræteus, De Morbis Acutis, lib. ii. cap. 6. His treatment and views are evidently confused, and without any clear conception of the nature of the malady, or of what he ought to do with it. What there is of good in his book is evidently copied from the writings of Celsus, of which it is very much a commentary. He is full of the notion of a redundant bile, and of the necessity of its evacuation.

Exactly at what period of time the word *morbus* became first added to this disease I am not aware, or wherefore it was done, as it appears to be gratuitous and unnecessary. It was, perhaps, added under the pretence of separating this disease from those affections of the mind termed *choler*, or *choleric*, angry passions or temperaments, or of distinguishing it from the mental affections which the Greeks termed *melancholi*. Whatever the motive may have been, the addition certainly gave it a more sounding and terrific effect, and especially when attached to one of the most awfully sudden and fatal of human maladies; and the Latins, in translating *melancholi* by *atrabiliaris*, thus made it wholly a bilious disease, and left it in no unequivocal sense but as originating in black bile.

The first use of this expletive addition that I noticed in the course of these researches was found in the Latin translation of Avicenna, the Arabian physician, printed at Venice in the year 1607, though it is possible its use might have been introduced still earlier. There is not much in Avicenna upon this disease that is at all satisfactory, it is but a rambling sort of copy from the Greek and Latin physicians.

I am now led to open the volumes of some of our more modern and recent writers upon this subject, as it will afford me, without much prefatory detail, the opportunity of introducing some novel views on this subject, which I have some time entertained, and which respect the nature and also the

proper classing of this complaint, and so introduced will remove the necessity of a more lengthened disquisition in explaining those opinions.

As standing among the first in erudition and comprehensive views, appears the work of my late esteemed and early friend, Dr. Thomas Young, whose premature loss all true lovers of science must sincerely deplore; he has, however, left behind him an imperishable monument of his acuteness, learning, and perseverance, in first opening the long-closed door of Egyptian literature by his unwearied labours with the triglyph stone, a very precious relic still seen among the rare treasures of our national museum. On this stone he first learnt to decipher the symbolical acrostic manner of writing, and of inscription, used by this ancient and wonderful people.

In that astonishing collection of nosologic matter, his *Medical Literature*, p. 287, Dr. Young, has noticed this singular disorder the *cholera morbus*, as he also terms it, and prepossessed with the feeling arising from the Greek name of it, and of the great medical authorities in respect to it, he fails not to apprehend it to be a disease of entirely bilious origin and character. And, perhaps, in endeavouring to reduce it to some given place in his general system of diseases, he not impossibly felt a little embarrassment where to arrange, and how to dispose of this three-legged monster of a disease, or under which of his genera he should particularly place it. Having for its characters a triple share, viz. vomiting, purging, and termina. And I may also confess that I remember to have had myself formerly, in early life an indescribable feeling of horror and confusion left in my mind, after reading in medical works a description of this complaint. Whether such might have been his feelings or not, when he was measuring this disease for its place in his system, I do not undertake to determine; but, however this might be, he at length makes his choice, and unfortunately fixes upon the purging character of it, which leads him to place it immediately under the genus, or order, of *Diarrhœa*. It was evidently necessary to fix it somewhere, as it must inevitably belong to one of the three, and could not with any propriety, as we shall see hereafter, constitute a class, or proper genus, of itself.

His choice, however, was unfortunate, inasmuch as we have already seen that the diarrhœa is not present in well marked cases of this disease, and even when it is, it is not by any means the leading character of it, nor of any fatal or destructive tendency; but is indeed almost as frequently absent as present, and therefore could in no respect be entitled to so predominant a distinction as that of being the essential or leading character of the disease.

Had he made his election upon the termina, or trophic character or symptom of the disorder, it would have brought out a very different issue in his arrangement, and in all probability would, after due consideration, have led him to have settled it among the species of the genus *Colica*, and from its destructive character to have given it a very prominent and foremost situation in this painful and fatal group or family of diseases, where, we are confident, it will ultimately be bestowed, and be found truly to belong. For it is now most evident that it is no proper choleric or bilious affection, such at least as the imagined Greek term cholera has generally served to convey a notion of, but a real cholic, with, in general, a suppression more or less complete, of this salutary function of the bile. This position for it will, we believe, greatly facilitate and tend to simplify all our views and apprehensions about it, and likewise its treatment, opening a way also to the fully appreciating the various descriptions and doctrines of its treatment which have, from an almost innumerable host of authors, been given and proposed for it as for an incomprehensible kind of disorder.

As to the vomiting, or third head of the Cerberus of a malady, it would appear to be no other than the mere natural effort of the stomach to throw off those contents which it finds an inability or want of power to act upon, and digest. Sometimes, indeed often, whether owing to mere debility and want of efficient force in the organ itself, the disease unrelieved, goes its course afterwards in spite of these efforts: at other times they prove an effectual relief, and where encouraged on this account by many eminent practitioners, particularly Sydenham. And where it is ascertained, which should be particularly enquired into, that the patient has eaten of stale pork, shell fish, hard mutton, certain fruits, or any of those things which undigested exhibit poisonous properties as we have formerly stated, it is, perhaps, in these cases to be encouraged by artificial means, especially if the quantity taken be such as the use of stimuli may be long in procuring the digestion of, otherwise the latter course would perhaps be safest in a general way to rely upon; many substances being perfectly inert when fully digested, which are rank poisons otherwise, destroying the patient through their effects upon the nerves of the stomach, and acting fatally by sympathy upon the brain, and in more protracted cases producing the appearances of a typhoid disease.

Should the human physician deem these views worthy his attention, they will, we believe, go far to

explain many circumstances and appearances attending the complaint that were before quite obscure and thought inexplicable. Under these views and impressions we shall now venture to take up some others of the most approved writers on the subject ; and first with reverential feelings due to so great a character for learning and worth, the justly-admired Sydenham, and we shall see, that guided by his acute practical observation, and that admirable tact which he so eminently possessed, and aided also by the study of the ancients, how very near he came to the true treatment of the disease, though his views upon it were evidently not distinct, but considerably clouded by the prevailing feeling of preceding ages, of its bilious character and a redundant bile. In other respects he describes the disease well, calling it cholera morbus, see Sect. 4. chap. 2. and says, that in his days, that is from the year 1669 to 1674, it made its appearance every year in the autumn season, on the first chills of the declining summer, with as much regularity "as the coming of the cuckoo in the spring, or of the departure in autumn of the swallow." He describes it with its three characters, vomiting, purging, and gripes, and recommends for its treatment, not exactly the warm water of Celsus and Hippocrates,* but something of a more digestible quality—plenty "of warm chicken broth;" it is in its effects not very distantly allied to our hot water, which, however, has the advantage, in all situations, of being more quickly attainable. He recommends encouraging the vomiting, and especially on no account to suppress it; and, aware that some cause of offence remained with the stomach, he recommends spear-mint tea also; and also laudanum in the advanced stage of the disease, but expressly forbids its use in the early stage, that it might not repress the vomiting. No doubt finding from experience that it tended to arrest the stomach from performing any of its usual functions, such at least it is fair to conclude would be its effect, and with injurious consequences as to digestion. But towards the latter end, and when in reality the danger has passed, he recommends, as did the ancients, small portions of generous wine. Here, according to our notions, he was somewhat deficient, and in a very bad case would, in all probability, have lost his patient, for the want of these stimuli being more early applied; but washing the stomach out instead of digesting its contents, may suffice sometimes in mild cases and in feeble attacks of the disorder, and hence the proceeding by emetic will often be found to have succeeded, as may be seen from the history of very many cases where the mustard emetics were employed which were much used in England at the commencement of the appearance of the epidemic, but were discontinued afterwards, from finding, perhaps, that they had often failed. For if we view the indication for cure rightly, "it is the return of the digestive, and chylopoietic functions" that can alone insure the safety of the patient.

And, in the course of our perusing later writers on this epidemic, both French and English, it was singular to observe, how frequently they relieved partially, and even at times wholly cured, their patients by stimulents opportunely exhibited, yet from their feeble manner of doing it, and in doubting and want of faith in what they were doing, instead of persevering, they often left them, in pursuing other measures, miserably to perish; not following up the treatment with the suitable auxiliaries in aid of the remedy: and what was most unfortunate, they afterwards drew conclusions unfavourably to the practice, and forbid their use as prejudicial and injurious, trusting, afterwards often, to the frail aid of mercurials, opium, bleeding, saline slops, venous injections, and other worse propositions.

At other times, again, were these strong stimuli applied naked, if I may be allowed the term, and with nothing given along with them, to qualify and aid in their operation, and therefore with injurious effects; for pure brandy in itself, and alone, is certainly no digester of food, quite the contrary; but where it acts well it is aided by combining with the mass of matter already in the stomach or with fluids given along with it: it then does so, by calling forth the powers of the stomach to throw out its juices and to perform those actions which are necessary to the digestive function: but where it was so circumstanced as not to produce these effects, it would be likely to do harm and be mischievous; or when not supported by the aid of warm demulcent fluids, or aided in every other way that could remove the operation of the paralyzing cause, it would get into discredit also. The placing the contents of the stomach favourably, in order to digest, and the whole system also, should first, we humbly apprehend, obtain our care and attention, and then the stimuli administered will generally have the desired effect; one measure co-operating with another, encouraging and aiding their effects by frictions and mechanical measures, not applied to the legs on account of the cramps, but to the abdomen itself and stomach, the seat of the mischief. Diluting also the spirit and facilitating its digestion, by easily

* Who appears to have taken it from Erasistratus, Lib. 2: as quoted by *Celius Aurelianus*, p. 262.—"Salutarium utatur tepide potu vomitum provocans vel acrimoniam temperans fellis."

digestible things given along with it, and aiding it, if there be occasion, by warm spices and other stimuli. Encouraging also, by tepid measures, all the organs concerned, and even the extremities of the body, all which circumstances are required in very bad cases. Milder cases will yield to very simple measures, such as friction, and warmth even alone, applied to the region of the stomach.

But if the case be only partially relieved, and these aids are but imperfectly administered, then a protracted case will be the issue, accompanied with those apparently anomalous effects upon the brain and nervous system which often, or generally, end fatally. So that the perfect resuscitation of these offices is indispensably necessary for the accomplishment of the restoration of the sufferer; and we may also see, on this taking place, a return of the most perfect health; that is, if the case has not been of the severest, and its removal has been speedily accomplished, and without much delay, as we might prove in the history of hundreds of cases, which shows most plainly that there can be neither contagion nor any thing fatally depressing about the disorder, even hardly a moment longer than its actual invasion so that the very same day, or the next day, the patient can return to his usual occupations, of which here is no example, I believe, after an attack of one of those diseases which are by practitioners generally admitted to be really and truly of a contagious character.

Sydenham recommends also gum arabic, and barley-water, with a view, apparently, to sheath and protect the coats of the stomach and bowels from the acrimony of the supposed bilious discharges. And we have thought, if to our hot water were added a little farina of some kind, as flour, starch, oatmeal, or arrow root, if at hand, it would more readily lead on to the commencement of the digestive process, than mere water, but not at all given with any view to sheath the mucous membranes from supposed bile or acrimony of any kind. A gentle stimulation with spices might also be not incongruously added to these farinaceous liquids; as fyan or white pepper, especially if stale pork, conger, shell-fish such as muscles, or unripe melon, has been the offending article.

Having thus copiously remarked on the works of this valuable writer, and as most of the other writers of eminence have generally drawn from him and partaken largely of his views, so we shall not proceed to a farther consideration of them, but in respect to a more suitable name for it, and a more appropriate locality in the general system of medicine; submitting, with all due deference, what we have to say on this head to the correction of abler heads and more practised hands than ours, for the devising something better; hoping that every attempt, however feeble, that leads to another attempt, may be thought a step and an advancement.

If, in following our suggestion, we may be permitted to place it along with its proper family, as we believe it to be, of the *Colicæ*, we should next propose to inscribe it, for its specific name, with the term *tridolor*, in allusion, as the reader will perceive, to its three disressing accompaniments, vomiting, diarrhoea, and tormina. And, as this proposition may be objected to, from the name *Colica* being subject to some ambiguity, as leading to the apprehension that it was the colon that was chiefly the seat of the disorder, which would not be true: for although this large intestine may at times chill, and become the first organ of the arrested function, yet is the stomach as often, or indeed much oftener, the first part affected; so that to do away all ambiguity, if such might be thought desirable, we should propose to unite the two genera into one that is, *Cholera* and *Colica*, under a new name, and in order to remove any possible misnomer, inscribe it with the name *Strophos*, the Greek appellation for the tormina, and which, perhaps, always present, attending all the species of the genus thus, making the griping or tormina the essential and leading character, of this large family.

And if after giving it this more natural arrangement, we might be allowed to give it a specific name also, indicative of its dangerous character, we should if it be not thought inappropriate, or till some better shall be devised, and we propose to give to it that it may also serve as a timely warning of the fatal consequences of its invasion if neglected, the epithet *Tetralge*, or *the four misery disease*, from *τετρα*, *quatuor*, and *αλγῆ*, *dolor*; conjoining to the three above enumerated affections, a fourth, viz. the wretched cramps and spasms of the legs and abdominal muscles, which so frequently, but not invariably, attend the disease: and thus constituted and titled, it may be said to be somewhat as the candid rattlesnake, always carrying about with it its salutary warning. Such is, however, merely a proposition for adoption or rejection, as may be judged right in a system of medicine. The public will ever, probably, continue to call it by the dread name of cholera morbus, though ambiguous and wrong as to its signification as now used. For names are of no mean importance in leading our views and opinions, and the nearer these approach or approximate to the truth, the danger of error will be the more diminished, and the facility of forming just reasonings and conclusions be augmented. The catalogue of the genera of human diseases will be also diminished by the measure we have proposed, by the removal of

one of its most obscure genera, which cannot but facilitate the labours of the rising generation of physicians in acquiring their art.

Arrived at this point of the subject, and furnished with the preceding data, we may now profitably turn our attention for a moment to the consideration of one of the latest and most popular, as well as most generally read and used, of the medical works of the present day; that of Dr. Mason Good, entitled, *Studies of Medicine*. At Vol. i., p. 248, we have his views of this complaint, and like a reputable systematist, he commences with taking the genus *Cholera*, and dividing it into three species—the *biliosa*, the *flatulenta*, and the *spasmodica*. In describing the first of these, the *biliosa*, he falls fully and without reserve into all the vague notions about the bilious character of the complaint, as, indeed, the name he has chosen for his first species implies; and under this apprehended species, he enters the one half of the dire history of this terrible complaint, reserving the other moiety of its hosts of slain, as an offering to his third species, the *spasmodica*, which are all most evidently but one and the same complaint, the spasms or cramps of the legs and abdomen accompanying the disorder, (as he himself indeed inadvertently admits) in both species; and it is to be remarked that these spasmodic affections do accompany the complaint most severely where there is considerable or excessive vomiting attending it.

As to his second species, *flatulenta*, is evidently, at least as we believe, no other than an anomalous case of wind colic, drawn in to fill up and make out a respectable family species. This serves to bring to our recollection as suiting the present place, what we had before purposely omitted to mention, the *cholera*, *Æpæ*, of Hippocrates, or *cholera sicca*, of his translators, or dry cholera; which, apparently in complement as it were to the great father of medicine, Hippocrates, Sydenham also makes mention of, but afterwards adds, that he never saw but one case of it, so that the existence of any real, essentially specific disease, may be fairly doubted: and may not such a case be easily explained, by a view of those cases of common cholera which are attended with no previous diarrhoea, and which would be necessarily a puzzle to those who were fully possessed of the notion of the bilious origin of this complaint, from whence they apprehended the purging sprang, and which to them would give it all the appearance of another and different disease. It would appear either to have been this, or some anomalous case of dyspeptic colic, reducible to no certain rule or character. And as to flatulency, or wind, it accompanies all kinds of imperfectly-arrested digestion, especially where the powers are strong to resist the access of the full character of the disease in a perfect suppression. And that such flatulency does generally occur, we may prove by reference to the description of Celsus, and innumerable cases recorded during the late epidemic; so that surely it cannot constitute with propriety a specifically-different disease.

There is one remark, I find, with Dr. Good, which appears to deserve a more particular attention here, and which seems to be well founded on fact, viz., that powerful impressions upon the sensorium, especially of a nature to excite grief, or any sudden alarm or fright, will sometimes have the effect of bringing on an attack of this complaint; and if such be admitted, it will go some way in explaining a considerable number of those cases of cholera, where the evidence of contagion appeared all but decisive. Instances of relations and friends falling immediately one after another, as though they had certainly communicated it to each other, gave to it indelible impression of an infectious disease: being seized in the presence of their friends, or dying before them, so filled them with fear and apprehension, and took such possession of their minds, that they became in consequence (other things perhaps, at the time conspiring, as similarity of food, and similar exposure to atmospheric impressions,) obnoxious to the disease, from a suspension of the proper functions of the nerves leading to the parts, which losing their influence over the digestive organs in particular, would induce the attack; so that nothing, under such circumstances, could shake the belief of the spectators that such were true cases of contagion. In the *Philosophical Transactions* for 1667, there is related a case, with every appearance of truth, where a terrible loud clap of thunder appeared immediately to have the effect of bringing on the disorder; and I think, in the course of perusing some of the more ancient writers on this disease, I have also seen recorded testimonies of its invasion from similar causes.

Dr. Mason Good seems very much to depend upon opium with tonics, as Calumbo root, in his treatment of the disease, given very much after the manner of Sydenham. As to the probable effect of opium we have already delivered our sentiments.

That dampness and chills, and not contagion, led to the complaint, is also strongly corroborated by a remark of Gendrin, p. 312, "*Le plus grand nombre ont été atteintes pendant la nuit,*" &c.; and Bouilland also informs us that smaller colicky affections of the stomach and bowels preceded for

several weeks the grand attack of the disease in Paris, so that the acting cause came on gradually, which would also appear to confirm our opinion of the nature of it, and to remove the idea of any specific contagion. These smaller affections were called by the French physicians, by way of distinction, the *Cholerine*.—*Traité du Cholera Morbus*, p. 191.

If further proof were necessary, we may have the most unquestionable of the propriety and advantages of the stimulant plan of treating this disease by reference to the writings of Dr. Burrel, (vide *Bombay Reports*, p. 68—80,) who states, that the bile sometimes flows during this complaint, which affords us the opportunity of saying, that neither its suppression or its flow is a necessary or invariable character in the disorder, but that either may happen according to the individual case; still a suppression is the more usual condition, from the cause we have formerly stated, viz., that that which arrests digestion will probably also have a tendency to arrest the flow of bile. And also from the works of Dr. Orton on *Indian Cholera*, 2 vols., Madras, 1820, and since edited in London. Also from the writings of Frederick Corbyn, an eminent surgeon in the company's establishment in India, and a considerable number of his medical associates, in an excellent communication to Sir Gilbert Blane, inserted in the *Medico-Chirurgical Transactions*, vol. ii., p. 110. On turning to the writings of Dr. Cullen, we see that he gives a most woeful description of the highly-bilious nature of this complaint, and that "the bile is acting both upwards and downwards." &c. As to his treatment, it is chiefly derived from Sydenham.

And now, in conclusion, may I presume to state that this stimulant plan of treatment was strongly urged by me, and with all the combined agents necessary to render it successful in the treatment of horses, as far back as 1804-5, and of which I ascertained and gave a full account to the public in a dissertation printed in London in 1815, where many interesting particulars and remarks may be seen not here introduced. And may I not also state, that from having contemplated the disease in the simple form in which it appears in the horse, I was led to extricate it from its so generally imagined bilious origin, and by comparing and transferring those observations to the human body, was led to see also that the bile had hardly more to do with the disease in the one case than it had in the other.

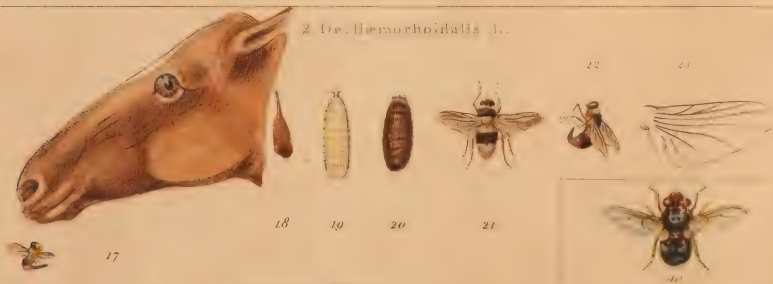
Having brought to a conclusion my observations on this perplexing malady, in token of long friendship and sincere regard, I now inscribe them to my very worthy and learned friend, Dr. Hodgkin.

Taunton-place, Regent's-park, 6 mo. 1st, 1833.

FINIS.



2. *O. de Hemorrhoidalis* L.



AN ESSAY
ON
THE BOTS OF HORSES,
AND
OTHER ANIMALS.

By BRACY CLARK, F. L. S.
VETERINARY SURGEON.

LONDON:
PRINTED FOR THE AUTHOR, AND SOLD AT NO. 17, GILTSPUR STREET.
1815.

W. Flint, Printer, Old Bailey, London.

ON

THE BOTS, OR OESTRI.

THESE singular Insects, whose Habitations are the bodies of living animals, are nourished in their Grub or Larva State in an extraordinary way, by feeding upon the juices of these animals, and in their winged state often infest and tease them, that they could hardly fail of attracting notice, and becoming an object of surprize and curiosity.

This curious race, with us in England, have obtained the name of *Botts*, or, more correctly, *Bots*, as the origin of the word would point out as the more proper mode of spelling it. The source or derivation of this appellation did not till very lately occur to me, and was not at all apprehended at the time I wrote an Essay on these Insects, addressed to the Linnean Society, and inserted in the 3d Volume of their Transactions. Our Lexicographers also appear to have been at a loss respecting the true origin of this word, on which we shall venture a suggestion that will appear, we believe, tolerably satisfactory. The derivation of it, we apprehend, is from the French word *Bout*, signifying the extremity or end of a thing, in the way we see it in the words *About*, *Bottom*, *Bottle*, *Botville*, &c.; the last of these alluding to one living at the end or extremity of a town, by elision or for brevity the *u* being omitted. From the same origin also we have *Butts*, houses placed without or at the extremity or end of a town, the *o* in

this case being for brevity omitted. Indeed the instances of its application are very numerous in our language.

The way or reason that these Insects became so designated, is pretty manifest, from the Habits more particularly of the second species of this enumeration, or *Hæmorrhoidalis*, which being fully fed its growth completed, in quitting its habitation in the stomach, and passing through the intestines, does usually hang for some days upon the margin of the Fundament, beneath the tail, then falling to the earth and forming a Chrysalis; and in this state would attract more particular notice and attention, occasioning often serious inconvenience and distress. So situated and observed, it was denoted the *Bout Worm* or *End Worm*, and by contraction *Bot Worm*; and afterwards, for want of better epithets, the appellation became extended to the Fly produced by this worm, and we obtain *Bot Fly*, though it is obvious, as the fly never affects these situations, its application is improper, and has served to disguise and conceal the real origin of the name.

Erroneous and strange notions were entertained in early times of these animals. What views the Romans had of them, we learn from a passage in Vegetius, an elegant veterinary writer in the time of Valentinian, in the fourth century. He says, “When a Humour is found in the anus of the Horse like a boiled bean, it is a sign of this disease (the Coriago) or hide-bound Horse, for *it is a sanies from the wounds* inflicted by small animals in the inside of the beast;*” in which it is evident he alludes to the second species, the hæmorrhoidal or red-tailed Bot, which in hanging, as we have stated, to the extremity of the rectum, corresponds very tolerably in size and appearance to the boiled Bean he compares it to. Still more antiently than

* Hujusmodi passionis signum est (morbus coriaginosus) cum invenitur humor in ano fabæ coctæ similis: est namque sanies ex illis vulneribus quæ bestiolæ intrinsecus fecerunt. Ed. Manheim, p. 63.

this does Moses in the sacred writings appear to allude to an Insect of this tribe in Egypt, that caused great dread ; but of what precise species this should be, we do not venture to make any conjecture.

In the Georgics of Virgil the attack of the Ox-bot upon the herd is strongly delineated, and perhaps correctly. The shrill sound, however, which Virgil describes, we have not been able to perceive ; and believe that the agony the fly occasions in depositing the egg in the skin, will account sufficiently for the violent agitation of the herd, without this sound. We, however, mention it, in order to direct the attention of others, who may have the opportunity, to this circumstance, and to confirm or reject this part of the poet's admirable description. His lines are these :

" Est lucos Silari circa, ilicibusque virentem
Plurimus Alburnum volitans, cui nomen Asilo
Romanum est, Oestron Graii vertere vocantes :
Asper, acerba sonans : quo tota exterrita sylvis
Diffugiunt armenta ; furit mugitibus æther
Concussus, sylvæque et sicci ripa Tanagri."

Georg. lib. iii. v. 146—151.

TRANSLATION.

" About the Alburnian groves, with holly green,
Of winged insects mighty swarms are seen ;
This flying plague, (to mark its quality,)
Oestros the Grecians call—Asylus we—
A fierce loud buzzing breeze ;—their stings draw blood,
And drive the cattle gadding through the wood.
Seiz'd with unusual pains, they loudly cry :
Tanagris hastens thence, and leaves his channel dry.
This curse the jealous Juno did invent,
And first employ'd for Io's punishment :
To shun this ill, the cunning leach ordains
In sultry summer heats, for then it reigns,

To feed the females ere the sun arise,
Or late at night, when stars adorn the skies."

DRYDEN.

The next notice of these animals in point of antiquity that we have yet observed is with the Veterinary writers of Constantinople, as *Absyrtus*, *Theomnestus*, &c. who appear to have designated them by the term *Teredines*, (*τερεδίνες*;) perhaps on account of their cylindrical figure; or it may be from their boring, as they apprehended, holes in the stomach, an apprehension and belief which prevails very much at this day among the ignorant, but is without foundation. The impressions or indentations they occasion upon the soft internal coats of the stomach, are often, it is true, pretty deep, but never, as far as we have seen, have pierced through the stomach; these indentations probably close and fill up again, after the Bot is removed; for the death of animals is certainly not designed in their use.

The Veterinarians of Constantinople for their cure direct us to extract them from the fundament with the fingers, and then kill them by strewing hot ashes over them; by which recommendation it would appear that they entertained some obscure apprehensions of their afterwards coming to something hurtful, if permitted to live, though it is probable their notions were very obscure, if they had any, of their real transformations.

The same Veterinarians, I observe, have also made an allusion to the Bot which infests the head of the Stag; of which, excepting what Reaumur has informed us, we know no more at this day than what they did, at least that I am acquainted with. Reaumur describes it as existing in a sac of the Fauces. What the complete Insect is, we are as yet unacquainted; and I mention it here to excite the farther prosecution of this object, which to those who have leisure and opportunity, and

especially those situated near parks of deer, might find it an interesting pursuit. These early Byzantine Veterinarians imagined this Bot fell from the stomach into the head of the stag, whilst the animal was in the act of grazing.*

Aristotle is also conceived to have alluded to these Insects in the prefatory part of his history of animals, in the following passage :—" There are, moreover, animals which first live in water, afterwards, their form changed, they pass their lives out of it, as the WaterGnats, and after the same manner come the *Oestros*, which afterwards infest animals." Aristotle, it is probable, used this term in a general sense for all such animals of the fly kind as infest the Horse, without having in view this Genus, as constituted by modern naturalists.†

Our ancestors of these isles, at no very distant period, entertained notions as ill founded and vague as any the antients had ever conceived ; for they supposed them somehow engendered of putrefaction and corruption, and that poverty and bad diet were favourable to their production. Blundeville wrote on Horses in the reign of Queen Elizabeth, and his words respecting them are these :—" And the third sort of worms be short and thick, like the end of a man's little finger, and therefore be called *Trunchcons*, though they have divers shapes, according to the diversitie of the place perhaps where they breede, or else according to the figure of the putrified matter whereof they breede : yet they no doubt proceed all of one cause, that is to say, of a *rave, grosse, phlegmaticke matter*, apt to putrefaction, engendered most commonly by fowle feeding," &c. Book III. chap. xvi. p. 43.

Our great dramatist, Shakspeare, in the same manner, makes the ostler at Rochester, in the play of Henry the Fourth, say

* Editio Basilicæ, p. 142. Ibid. Latine reddita Ruellio, p. 55.

† Duval's Aristot. Lib. I. cap. i. Tom. II. p. 763.

thus :—"Peas and beans are as dank here as a dog, and that is the next way to give poor Jades the Bots:" a happy description of the popular notions respecting them of those days; and the wretched nag of Petruchio, with his ill appearance and poverty, is in true character described as "so begnawn with the Bots."

Fearful apprehensions are entertained, even at this day, by the ignorant; for if, by any chance, they are presented with the singular spectacle of the Horse's stomach having a cluster of Bots hanging to it, they are almost sure to enumerate it among the causes of his death, with expressions of horror, though amply accounted for by the actual destruction of some viscus, or other causes; and seeing the coats of the stomach indented and impressed where they adhered, they let imagination carry them to the real perforation of the stomach, stating it as eaten up, and gnawed through by them.

Knowledge, which usually unfolds her treasures to the labours of the industrious and persevering, first dawned on this branch of science in Italy, about the commencement of the last century, when the discovery of the circulation of the blood gave a zest to the studies of Anatomy, and called up much laborious investigation of the structure of the bodies of animals; and the formation of the Royal Society held out an encouragement and place of deposit for the labours of the inquisitive, and brought about a more close and correct notice and consideration of the various objects of nature.

Malpighi, as far as I yet know, was the first who undertook to describe them intelligibly, though very briefly, and only the Larva, in a paper or memoir laid before the Royal Society on a different subject.* The Larvæ he described were found in the stomach of an Ass, and were probably those of the *Oestrus*

* *Malpighi Opera*, De Structura Glandularum Epistola, p. 9.

Equi. He went no farther than describing their general appearance.

Redi next took a more extended and particular notice of them, giving some details of their history.*

At this early period of advancement in their knowledge crept in error, from a too loose and careless observation, and which was received and spread with its usual facility. Dr. Gaspari propagated a belief, that these flies, to get their larvæ into the bodies of animals, entered by the fundament, and there deposited their eggs; a thing that was utterly impossible, without their wings being mutilated or destroyed in the act: and the account, though perfectly fabulous, was but too easily believed, and even by such naturalists as Vallisneri, Reaumur, and Linneus himself, who says of the *Hæmorrhoidalis*, "*Habitat in Equorum intestino recto, mirè per anum intrans.*" Syst. Nat. p. 970. These wonderful accounts, though erroneous, might serve one useful purpose, by exciting the public curiosity the more, and lead by this to a farther research into their true Habits and History.

The first who took much pains in considering them was Vallisneri, an Italian Physician of Padua, and the pupil of the celebrated Malpighi. With great industry, perseverance, and a care truly philosophic, he succeeded in exposing a large share of their natural history; he bred for the first time, atleast that we know of, the perfect Fly from the Grub, in the backs of oxen, and traced its transformations till it arrived at the winged state, though only one, and in a very mutilated state. His first Essay, however, was written upon the Bot of the Sheep, which inhabits the frontal and maxillary cavities of this animal. He accompanied his account with coarse figures of them, both of the Larvæ and perfect Insects. His Essay appears to

* Redi Francis Esperimenti intorno agli Insetti, p. 170.

have been written about the year 1712. Subsequently, in the second volume of his Works, he gives some less accurate details of the Horse-bots. The accounts of this indefatigable writer are plentifully stored with Quotations from the Italian and Latin Poets, in the passages in which he apprehended allusion was made to these animals; and he unfortunately too implicitly gave credit to his friend and countryman, Dr. Gaspari, respecting their mode of propagation, which led others more readily to believe in the same delusion.*

The truly ingenious Reaumur, in France, was, in point of time, the next who studied the manners of these animals. He repeated nearly all the experiments of Vallisneri, giving farther details, and a better account of them, accompanied with more correct figures. He succeeded, though with much difficulty and labour, in obtaining two or three flies from the Maggot of the Ox-bot. His details, though somewhat prolix, are interesting; but his matter, however, is not kept separated from other objects, and we may observe that, if all the very numerous subjects of natural history were so treated, no ordinary time would suffice for the perusal of the volumes they would extend through.

Linneus has usefully exhibited an example of conciseness for these pursuits, which rebukes, as it were, the dilated details of several writers in natural history of this period. The actual fly of the Ox-bot has been truly rare, and difficult to obtain, and is seldom met with in Cabinets of Insects; and what is singular is, it remained unknown to Linneus to the last, for he described, through all the editions of the *Systema Naturæ*, the large Horse-bot with spotted wings, for it. I propose hereafter, when I treat of this species in particular, to give an account of a method I used for procuring this Fly, and that

* Vallisneri *Opere Physico-Mediche*, Venezia 1733, p. 217, et Vol. II. p. 1

without much difficulty, by which any one may obtain it readily for his observations.

Reaumur, having pursued the Sheep-bot through its changes, obtained from his own coach-horses the Larvæ of the Hæmorrhoidal or Fundament Bot, and bred the Fly from it. He was successful also in raising to the Fly state, another and more rare species, the *Oe. Veterinus*, or *Red Bot-fly*; but, like Vallisneri, he was in doubt and perplexity whether they were varieties or the same species. His figures are better than Vallisneri's, which were hardly cognizable or characteristic enough to identify the species; being taken, perhaps, from mutilated specimens, or drawn without sufficient care, or from the difficulty of finding artists at this period. But what is most singular is, that neither of these celebrated naturalists appear to have known our common large Horse-bot, (*Oe. Equi*), which made these writers much more difficult properly to understand; or if they knew it, they have at least not figured or described it.

In a subsequent volume, Tom. V. of this ingenious writer, (*Memoires sur les Insectes*), he has given us an account of the Bot of the Stag, at least the Grub or Larva, for the Chrysalis or Fly he appears not to have known. He found these Larvæ in a sort of capsule or sac of the Fauces near the root of the tongue, and it is probable we may possess in our cabinets the perfect Insect of this Larva, which chance or accident may have thrown in our way, without knowing what it is, as it has never yet been bred through its different states, in order with certainty to identify it. Whether the Fauces or the large opening of the Eustachian Trumpet into the Fauces of these animals, is their proper habitation, we know not, or whether they crawled thither after death, from the sinuses of the face or any other parts, is uncertain. I have remarked, however, that those

Larvæ which infest the Horse's stomach never let go their hold, or move after the death of the animal, but are always found fixed to the coats of the stomach, that this apprehension of their moving after death is perhaps without real foundation.

To obtain certain information of this species, and procure the Fly, would not be an unpleasing task, or difficult to execute, by one having leisure and the opportunity of a park of deer for his observations. It would be only necessary for this purpose to keep a few of these animals for the two or three summer months, or through the months of June or July only, in a confined place, having a smooth floor, or one boarded or bricked, on which, by frequent search, the Larva fully grown, and falling from the nose or mouth, or perhaps the anus, would be easily discovered, and its advancement afterwards to the perfect or winged state would be attended with little or no trouble or difficulty. The Larva of this species, as figured by Reaumur, has considerable affinity to that of the Sheep, but is larger, and somewhat differently coloured. See Tom. V. p. 67, Pl. 9, fig. 2, 6. I mention this the more particularly to draw the attention of others to it.

The next who has given us any account of these Insects worth noticing is Baron De Geer, an Envoy or Ambassador, we believe him to have been, from the French Court to the Court of Sweeden. He was eminently skilled in the natural history of Insects, and was the intimate friend of Linneus. He described the true Ox-bot, and the large *Horse-bot*, and was aware of the Linnean error in respect to these two Insects, which it is singular Linneus did not avail himself of, but, like an original writer, he perhaps perused but little those that followed him. De Geer, however, not having perhaps ever seen the *Hæmorrhoidalis*, confounded it with the Ox-bot, from the similarity of its description. His figures are but indifferent, and very inferior to those of Reaumur; nor has he much more than

copied the remarks of Reaumur in respect to their history. He has called the great Horse-bot *Oestrus Intestinalis*, a name we cannot acquiesce in, as this species truly lives in the stomach, and merely passes through the intestines in its way to the ground to become a *Chrysalis*.

The next writer on this subject was Linnæus himself, whose acuteness, taste, and indefatigable research, the admirers of natural history will long have cause gratefully to remember. He furnished us with some interesting details respecting the Rhein-deer Bot, acquired during his tour in Lapland, and he marshalled, for the first time, the members of this singular family, under the generic title *Oestrus*, separating them from the other families of flies, hostile to the repose of animals. He enumerated five species, all European, as follows :—*Oes. Bovis*, intending to give the Ox-bot, but described by mistake the large Horse-bot, with spotted wings for it. The *Oc. Tarandi*, or *Rhein-deer Bot*. The *Hemorrhoidalis*, or *Red-tailed Horse-bot*. The *Nasalis*, for so he termed the next species, from supposing that it entered and lived in the larva state in the fauces or nostrils of the Horse, which, as it now appears to be erroneous, we have ventured to set aside the name, and to call it the *Veterinus*, as the former name if preserved would ever convey a false notion of its habits. The name *Veterinus* signifying of or belonging to beasts of burden, and not implying any precise place in respect to its habitation, we think better suited to it, at least it may continue till its history is completely made out. Wanton change in names cannot be too much reprobated ; but when a strong necessity, from actual research and discovery, makes it necessary, it becomes a duty ; as specific names are intended as aids, but not immoveable fetters, to natural history.

His fifth species was the *Oestrus Ovis*, or Sheep-bot. The number has since been more than doubled by succeeding writers.

After Linnaeus followed a considerable number of detached notices of these Insects, by various writers of France, Germany, and Sweden, without adding much to our knowledge of them ; as Geoffroy, Wohlfahrt, Fischer, Leske, Ross, Villers, Sultzer, Frisch, Modeer, &c.

An entomologist of great eminence, J. C. Fabricius, of Kiel, in Holstein, is the next we have to notice as a writer on this subject. He was a pupil of Linnaeus, and indefatigable in describing and adding to the enumerations of his great master, the Insects which the numerous collections and cabinets of Europe afforded, and by which he has vastly increased the numbers described by his predecessor, and his descriptions and nomenclature are often truly excellent. In his last work the *Systema Entomologia Emendata*, he has, however, obscured this genus in a way that it will not be easy to unravel. He has given an *Oestrus Bovis*, with a description nearly corresponding to the true one, *alis immaculatis*, &c. but immediately refers to the Linnean *Bovis alis maculatis*, and continues the Linnean references.

Under the title of *Equi*, he has described the *Oc. Veterinus*, under which the Hæmorrhoidalis is introduced as a variety β ; so that a description of our common *Oc. Equi*, is altogether omitted as a species, at the same time the variety of it, β , of my account, and of the Linnean *Fauna Suecica*, is presented as a distinct species, under the strange title of *Oc. Vituli*, as though calves were subject to them ; and beneath it again is a reference to the true *Equi* of Geoffroy.

The commission of errors like these, in a genus whose species had been more numerous, might have defied the possibility of detection, whilst the patient investigator might endeavour to understand them with unavailing labour. Nor can I observe without regret, in this respectable work, such a direct abuse of the intention of synonyma, which far from assisting as auxiliaries

to the description which they ought to do, serve only to perplex by their perfect disagreement. His generic characters of this genus are also false, as though made by guess more than examination.

It has been doubted whether these animals possess any mouth : Linnæus expressly says, "*Os nullum punctis tribus*;" but when the hairs are removed, which in every species very much obscure the parts of the mouth, two clavated *palpi* are seen, and between them the opening of the mouth ; and by laying open the vesicular or inflated part of the face, the continuation of it is visible in the form of a membranous *haustellum*, which is generally coloured with some dark brown matter lodging on the inside ; though I confess, after repeated dissections, I have not been able to trace this *haustellum* farther than the inside of the inflated part of the head, where it appears to enlarge and terminate.

Fabricius has minutely described *labia* to the *haustellum*, and other apparatus to the mouth, which I have not been fortunate in obtaining a sight of. At the same time I cannot help being surprized that he should have overlooked the *palpi*, which he expressly denies the existence of, though tolerably visible even without the aid of glasses.*

He added also to his enumeration the *Oe. Trompe* and the *Oe. Pecorum*, and one or two of the American species of Bots, or rather subcutaneous flies, which on more minute inspection we are induced to separate from this genus, and form them into a new family, under the generic title *Cuterebra*, three species of which we propose to give, for the first time with figures.

After Fabricius, Professor Gmelin published an enlarged edition of the *Systema Naturæ*, and collating from all quarters, vastly enlarged in appearance the extent of this family ; but unfortu-

* Fabricii Genera Insectorum.

nately copying from books, without any knowledge of the animals themselves, he fell into numerous errors. Three species he added to the enumeration of Fabricius, from the works of Pallas, viz. *Oe. Antelope*, *Fasciculosus*, and *Hominis*, which there is much reason to believe from his descriptions are all false; and instead of placing the *Equi* in the name of *Bovis*, as his excellent original had done, we find the *hemorrhoidalis*; and by placing the *Equi* again in the name of *hemorrhoidalis*, and mixing the references to each, an almost inextricable labyrinth of confusion is the consequence, while the true *Bovis* still escapes undescribed, unless as being the same as *hemorrhoidalis*.

The mistake of *hemorrhoidalis* for *Bovis* arose probably from their similarity in description, in which they certainly interfere very much; though no two species can be more distinct when seen together than these. This will ever be the bane of mere compilation in natural history.

In continuing to the present time this brief view of their history, or the detection of their habits, I am necessarily led to notice a memoir or essay of my own, formerly transmitted to the Linnean Society, and published in the 3d volume of their Transactions, p. 289, of which I consider this present work as only a more digested and extended account. This was in the year 1796, or about nineteen years ago; and which memoir, as it adds a few new discoveries respecting them, concludes this historical view of the developement of their habits.

We are led to apprehend, that this family may be usefully divided into three sections or subdivisions, according to the different parts or situations in the body the Larvæ inhabit, viz. the *Gastricolæ*, or those which inhabit the stomachs of animals. It

separates those of the Horse from all the other species. The next division will be the *Cuticolæ*, or those which live in their Larva state beneath the skins of animals ; and the third the *Cavicola*, or those living in the cavities of the face. Perhaps a fourth division might be constituted, including those of the *Fauces*, if the accounts we at present entertain of them be true, and the nerves of the wings of these different families appear also to afford characters for these divisions, which was first observed to me by my friend Dr. Leach.

The *large Horse-bot* being the most interesting to us in this country, I shall begin my account with that species, and follow it with the other species of that division.

Of the OESTRUS EQUI, or Large spotted winged Horse-bot.

As it is necessary to break into the circle of its history at some point, I shall begin with an account of the egg, and its deposition upon the skin of the legs of the horse, which is done in the following remarkable manner:—When the female has been impregnated, and the eggs sufficiently matured, she seeks among the horses a subject for her purpose, and approaching him on the wing, she carries her body nearly upright in the air, and her tail, which is lengthened for the purpose, curved inwards and upwards: in this way she approaches the part where she designs to deposit the egg; and suspending herself for a few seconds before it, suddenly darts upon it, and leaves the egg adhering to the hair: she hardly appears to settle, but merely touches the hair with the egg held out on the projected point of the abdomen. The egg is made to adhere by means of a glutinous liquor secreted with it. She then leaves the horse at a small distance, and prepares a second egg, and, poising herself before the part, deposits it in the same way. The liquor dries, and the egg be-

comes firmly glued to the hair : this is repeated by these flies till four or five hundred eggs are sometimes placed on one horse.

The skin of the horse is usually thrown into a tremulous motion on the touch of this insect, which merely arises from the very great irritability of the skin and cutaneous muscles at this season of the year, occasioned by the heat and continual teasing of the flies, till at length these muscles appear to act involuntarily on the slightest touch of any body whatever. See Pl. I. fig. 1.

The inside of the knee is the part on which these flies are most fond of depositing their eggs, and next to this on the side and back part of the shoulder, and less frequently on the extreme ends of the hairs of the mane. But it is a fact worthy of attention, that the fly does not place them promiscuously about the body, but constantly on those parts which are most liable to be licked with the tongue ; and the *ova*, therefore, are always scrupulously placed within its reach. Whether this be an act of reason or of instinct, it is certainly a very remarkable one. I should suspect, with Dr. Darwin,* it cannot be the latter, as that ought to direct the performance of any act in one way only. Whichever of these it may be, it is, without doubt, one of the strongest examples of pure instinct, or of the most circuitous reasoning any insect is capable of.

The horses, when they become used to this fly, and find it does them no injury, as the *Tabani* and *Canopes*, by sucking their blood, hardly regard it, and do not appear at all aware of its insidious object. During warm sunny weather this process is seen performed on commons, and in the fields.

The eggs thus deposited, (see fig. 2, and when magnified fig. 3,) I at first supposed were loosened from the hairs by the moisture of the tongue, aided by its roughness, and were conveyed to the stomach, where they were hatched : but on more minute search

* *Zoonomia*. *Vid.* Chapter on Instinct.

I do not find this to be the case, or at least only by accident ; for when they have remained on the hairs four or five days they become ripe, after which time the slightest application of warmth and moisture is sufficient to bring forth in an instant the latent *larva*. At this time, if the tongue of the horse touches the egg, its *operculum* is thrown open, and a small active worm is produced, which readily adheres to the moist surface of the tongue, and is from thence conveyed with the food to the stomach. If the egg itself be taken up by accident, it may pass on to the intestinal canal before it hatches ; in which case its existence to the full growth is more precarious, and certainly not so agreeable, as it is exposed to the bitterness of the bile. I have often had proof of this by making the following experiment with the eggs.

With a pair of scissars I clipped off some hairs with the eggs on them from the horse, and on placing them in the hand, moistened with saliva, they have hatched in a few seconds. At other times, when not perfectly ripe, the Larva would not appear, though held in the hand under the same circumstances for several hours ; a sufficient proof that the eggs themselves are not conveyed to the stomach. See fig. 4.

It is worthy of remark, that it is probable the greater part of the *ova* deposited by this fly, are taken up in consequence of the irritations of other flies, as the *Canopes*, *Tubani*, and *Musca*, who, by perpetually settling on the skin, occasion a horse to lick himself in those parts, and thus receive the *larvæ* on the tongue and lips ; and a horse that has had no *ova* deposited on him, may yet have the Bots, by performing the friendly office of licking another horse that has. The eggs on the shoulder are particularly well disposed for being received in this way.

It is fortunate for the animals infested by these Insects, or rather most beautifully ordained, that their numbers are much reduced, and kept within due limits, by the hazards they are exposed to in the singular round of their propagation. I should

suspect near an hundred at least are lost for one that arrives at the perfect state of a fly. In the first place, in the depositing the eggs not a little interruption is given to the female by the movements of the Horse: the eggs when deposited may remain on the hairs untouched by the animal, unless some casualty makes him lick those parts to which they adhere, and when ripe, or if hatched and opened by rain, or other moisture, the larvæ may come forth, and crawl about till they die.

In the mouth of the animal they have the dreadful ordeal of the teeth and mastication to pass through. On their arrival at the stomach, they may pass, mixed with the mass of food, into the intestines; and, when full grown, on dropping from the *anus* to the ground, a dirty road or water may receive them. If on the commons, they are in danger of being crushed to death, or of being picked up by the birds, who so frequently for food attend the footsteps of the cattle. By such contingencies as these, Providence has wisely prevented their too great increase, and the total destruction of the animals they feed on.

The egg is glued on the hair with the broad end downward, (see fig. 2, 3,) and is thus well disposed for the operation of the tongue in removing the operculum. This operculum is of an oval figure, surrounded with a prominent margin. The microscope shews the case of the egg to be shagreened in squares, or divided by lines longitudinally and transversely disposed.

Of the Larva or Grub of the OESTRUS EQUI, or spotted Horse Bot.

At its first hatching it is, as we have observed, a small active worm, long in proportion to its thickness, but as its growth advances, it becomes proportionably thicker and broader, and beset with bristles.

Some of these Larvæ, when about two-thirds grown, are represented in Plate I. fig. 5, adhering to the stomach. They are

very frequent in horses that have been at grass, and are in general found adhering to the white insensible tissue or coat of the stomach which comes from the lining of the œsophagus, and which in extending or leading over the upper part of the stomach, represents, or is similar to, the maw or first stomach of the ruminating animals. I do not recollect ever seeing many situated on the red membranes of the stomach, which are, without doubt, more sensible, and where their effects would have been more disagreeably felt.

They make small deep round holes where they adhere to this white tissue, and sometimes so deep as to pass through it but not through the other layers or coats of the stomach, as has been often hastily apprehended and asserted, that they are probably but little felt by the animal. In proof of this, I once gave six, and afterwards twenty-seven, of the full grown Larvæ to a horse, wrapt up in balls of meal, but the horse by no external indications showed any uneasiness in consequence.

They usually hang in dense clusters to this white cuticular lining of the stomach, and maintain their hold by means of two dark brown hooks, (see fig. 10, Plate I.) between which a longitudinal slit or fissure is seen, which is the mouth of the Larva. When removed from the stomach by the fingers by a sudden jerk, so as not to injure them, they will, if fresh and healthy, attach themselves to any loose membrane, and even to the skin of the hand. For this purpose they sheath or draw back the hooks almost entirely within the skin, till the two points come close to each other; they then present them to the membrane, and keeping them parallel till it is pierced through, they expand them in a lateral direction, and afterwards, by bringing the points downwards towards themselves, they include a sufficient piece of the membrane, to remain firmly fixed for any length of time as at anchor, without requiring any further exertion.

These hooks, the better to adapt them to this purpose, appear

to have a joint near their base. The Larvæ of (*E. Hamorrhoidalis* and *Ovis*, and probably all those which feed on the mucous membranes lining the internal canals of the body, are also furnished with these *tentacula*; whilst those Larvæ which inhabit beneath the skins of various animals will be found universally without them, being confined in the capsule of the skin sufficiently secure.

The body of this Larva (see fig. 6, Plate I.) is of a whitish red colour, and appears to be composed of eleven segments, surrounded with a double row of horny bristles, a longer and a shorter series, and placed alternately. The two last segments appear naked, or destitute of them. These spines are of a reddish colour, except the points, which are black, and are directed towards the tail or large end of the Larva; they are longer below or on the belly of the Larva, than above or on the back, but are still longer at the sides. By means of these they probably regain their situation, if at any time they are detached from their hold, by forcing them against the surrounding membranes, and are assisted by the two crotchets or hooks at the head. I once met with some of these in the duodenum, close to the pylorus, having been carried perhaps into the intestines by some casualty, and could not again regain completely their situation in the stomach.

The aperture of the mouth appears surrounded with a prominent margin, and is irregular and harder than the rest of the skin; but whether hard enough to masticate and feed on the vegetable matters in the stomach, may be a question. Their food is most probably the chyle, or, as it is in this state by some modern anatomists termed chyme, or an imperfect sort of chyle, which being nearly pure aliment, it is probable affords but little excrementitious residue. That it is the gastric chyle and not the vegetable matter that they feed upon, is also rendered probable from the support of the other species of this genus on purely animal secretions.

At figure 11 is seen a convoluted tube, which, in dissecting one of these, once presented itself to me, and which I apprehended was the alimentary canal or intestine of the Larva.

On opening the body of the Bot, and removing the gelatinous matter, the air tubes are seen, of a splendid silvery colour, or as though injected with pure quicksilver. Their appearance is singularly beautiful, especially if the Bot be alive, or recently dead; and it was in reality what first attracted my attention to these objects, for if dead, and kept some time, these tubes become dull, and of a brown colour. This glittering appearance arises from the air being seen through the semitransparent pearly refracting coats of the vessel. They remain distended by their own inherent elasticity, and are filled with air to their minutest ramifications. These branches often run up and down in the gelatinous matter, in directions nearly parallel to the principal trunk.—See fig. 11.

These tracheæ or air pipes are eight in number in this Larva, and their disposition is endeavoured to be represented at fig. 7. The two smaller ones, exterior to the central circle of larger ones, appear to communicate with two small prominent nipples or points upon the first segment, which are seen in fig. 10.

These tracheæ or air tubes open into one common reservoir, at the large end of the Larva, beneath a singular plate, fig. 9, of a cartilaginous or horny consistence, having six semicircular lines, with their points curved and opposed to each other; these lines are also made up of alternate depressed and elevated spots of black and white; and at this blunt extremity are also seen two protuberant lips or sacs, filled with a watery fluid, which meet and serve to close over and cover up this horny plate.—See fig. 8.

Through this plate the air is perhaps admitted into these tubes, the branches of which appear to terminate in the skin, the gelatinous matter, and upon the viscera. In most Larvæ of the fly

kind, or of the dipterous order of insects, there are two distinct plates at this obtuse end, as may be seen in the common maggot of the house fly and the blow fly. Keller, however, supposes, and it is generally apprehended, and perhaps truly, that the air is not received at this large end, but at the extremities or terminations of these branches in the skin, forming on the sides, what are called the *spiracula*.

The lips at the obtuse end of the Bot seem designed to conceal and cover this horny plate, and defend it from the liquors of the stomach, or clean and clear it of these gastric fluids or other matters when necessary. In the Larva of the *Æs. Ovis*, or Sheep Bot, this respiratory plate is not covered with lips in this way, but is surrounded by a prominent margin or extension of the skin, which closes over the plate, at the will of the animal, and on opening again suddenly, is often attended with a distinct snap, that may be heard to some distance. These lips as we have stated appear to be mere membranous bags, and filled with lymph only, which renders it probable that they are solely for the convenience of the Larva, and form no part in the future Insect, as are probably nearly or quite all the parts connected with the skin.

Respiration appears to be the office of these air canals, which are the lungs of the Larva; and, considered in this point of view, they are much larger than the respiratory organs of any other animal: which is the more extraordinary, if the purpose of respiration in animals be the production of animal heat, as the later chemists suppose, this being altogether unnecessary to Larvæ that are supplied so abundantly with it from the high temperature of their residence in the living stomach; nor can these organs be formed for the purposes of the future insect, since they cannot be detected in either the Chrysalis or Fly. The permeability of these respiratory vessels to oxygen gas, is also to be taken into the account. They would appear to be in these animals stouter

and less permeable than are the cells of the lungs formed of a thinner membrane.

I have since found that air vessels of a similar structure may be detected in the Larvæ of most insects, as well in those that are not exposed to any extraordinary temperature as those that are; they are, therefore, not constructed with any view to these singular situations.

From the superior magnitude of the respiratory organs in most of the Larvæ of insects, one should be almost led to imagine that the respiration in all animals was more intimately connected with the reception of food, and the converting it into living matter, than any other design.

In corroboration of this we may observe, that while the respiratory organs are so large in the Larvæ, they are remarkably small in the perfect insect, which also, in general, has occasion for very little food.

Perhaps the superior size of the air vessels of the Bot, compared with the Larvæ of other insects, arises from the greater rarefaction and impurity of the air it is exposed to in the stomach, which may render a larger portion of it necessary.

Whilst upon this subject it may not be improper to notice the air vessels of the Larva of the *Musca pendula*, which are constructed in a very different way from any others I have seen. The two principal trunks in this Larva are made up of semi-circular cartilaginous rings or fibres, which are disposed in a spiral direction, so as to form the tube. It is evident by this structure, that the area of the tube may be entirely obliterated, and the sides be brought into contact.

The convenience attending this structure, to a Larva living in putrid fluids of considerable depth, appears to be, that beside its use in respiration, it may serve the same office as the air bladder in fishes, regulating by its contraction or expansion the den-

sity or rarity of the included air, and consequently the descent or ascent of the Larva in those fluids.

These Bots, as is also the case with two or three other species, pass the autumn, winter, and spring months in the stomach, and arrive about the commencement or middle of the summer at their full growth, requiring a twelvemonth fully to complete their structure. The slowness of their growth and the purity of their food must occasion what they receive in a given time to be proportionably small; from whence probably arises the extreme difficulty there is found in destroying them by any medicine or poison thrown into the stomach. After opium had been administered to a horse labouring under a case of locked jaw for a week, in doses of one ounce every day, on the death of the animal I have found the Bots in the stomach perfectly alive. Tobacco has been employed in much larger quantities in the same complaint, and has been also longer continued without destroying them. They are also but rarely affected by the drastic purgatives which bring away in abundance the *Tenix* and *Ascarides*.

It is to be remarked, these Larvæ probably never change the skin, which is very dense and tough, and becomes at last the shell of the Chrysalis; and we may therefore discover upon the Chrysalis all the points and lineaments of the Larva dried up and diminished, in most other insects a cuticle separates from the skin at the time of this change. The small end of the Chrysalis, in all the species of this genus, contains the head of the Fly, the contrary being the case with almost all other insects.

This species, though common with us in England in the Fly state, in the Chrysalis state is rare and difficult to procure; and for this reason, that the Larva when full fed and grown to its size, escapes from the stomach and through the intestines, without making any stay or lodgment at the fundament, as the next species does, which affords us the more easy opportunity of pro-

curing it. The specimens which I have obtained of its Chrysalis have been found upon the ground, or under horse dung ; its appearance is given Pl. I. fig. 12.

It is fortunate for the animal, or rather we should say it is beautifully ordered and provided, that the Larva of this species should make no stay at the edge of the anus, as far at least as we have yet observed, and as is the case with the next species ; for it is obvious, had it so done, its roughness and more considerable dimensions would have rendered it a very serious evil.

Whether these Larvæ can exist in the stomach of a carnivorous animal I am not certain. I gave upwards of a hundred eggs (proved by trial to be ripe, and containing a living caterpillar,) to a cat in milk at various times ; and on destroying her at the end of two months after the first portion had been given, no traces of them in the stomach or intestines could be discovered.

I have once seen the Larva of this Oestrus in the stomach of an ass : indeed there is little reason to doubt their existence in the stomachs of all this tribe of animals.

The Larva, when matured and ripe, quits the stomach of the animal, and falls to the ground, and finding a convenient place of retreat, undergoes its change to Chrysalis, the skin then losing its organization, and changing its colour to a reddish brown. After remaining torpid in the state of Chrysalis a few weeks, the superfluous moisture being removed, and the parts of the future Insect being hardened by drying, it bursts from its confinement, and the Fly appears making its exit at the small end, (see fig. 13 and 14, the male and female,) and the head or face of the Fly very much enlarged, fig. 15, and one of its wings magnified, showing the distribution of its tendons or nerves, fig. 16.

On quitting their shell they in a few hours become dry, take wing, and then seek their mates. The female being impregnated, searches for a proper subject among the Horses, performs

with great solicitude and care her office of depositing the eggs on the legs of the Horse, in the manner we have already stated; thus completing the wonderful round of its operations and history, which sometimes I have thought might not afford a subject altogether unworthy of the poet's pen, being novel, innocent, and full of singular incident; and if mingled with the probable designs of an all-wise Providence in thus providing for them, and their probable benefits to the animal in return for their habitation, and a description of the dangers and solitudes attending the process of their birth and breeding: the rural scenery of the places of their resort, and of these exploits, and with useful reflections arising from such incidents, it might be rendered perhaps, in good hands, not destitute of interest and amusement.

There is considerable difference in the male and female Fly; the extremity of the abdomen in the one is obtusely abbreviated, in the other drawn out to a style or horny tube of some length, for the more convenient depositing the eggs and applying them to the hair.—See fig. 1. Pl. I.

The perfect Fly but ill sustains the changes of weather; and cold and moisture, to any considerable degree, would probably be fatal to it. It is remarkable these flies never pursue the horse into the water. This aversion I imagine arises from the chiliness of that element, which is probably felt more exquisitely by them, from the high temperature they had been exposed to during their Larva state in the body of the animal. The heat of the stomach of the horse is much greater than that of the warmest climate, being about 102 degrees of Fahrenheit, and in their fly state they are only exposed to 60, and from that to about 80 degrees. This change, if suddenly applied, would, in all probability, be fatal to them; but they are prepared for it, by suffering its first effects in the quiescent and less sensible state of a Chrysalis. I have often seen this Fly during the night-time, and in cold weather, fold itself up, with the head and tail nearly in contact,

and lying apparently in a torpid state, though in the middle of summer.

To prevent unnecessary repetition, these Flies are described with the other species, both in English and Latin, at the conclusion of this Essay.

On the OESTRUS HÆMORRHOÏDALIS, or Fundament Bot.

I shall begin my account of this species at the same point as the former, with the deposition of the egg, the manner of which, I apprehend, has never been described or known before.

This proceeding I have frequently witnessed, and it may be seen by any one desirous of observing so curious a fact upon most of the commons of this country. About Ditton, Molesey, and Esher, I have more particularly seen it where the cattle are much annoyed with it; and I once also saw this same operation in the fertile meadows of Holland, near to Groningen, while being conducted a prisoner through this country to Amsterdam, and I have caught the Fly more than once in the very act in my hands.—See fig. 17. Pl. I.

The part chosen by this Insect for this purpose is the lips of the Horse, which is very distressing to the animal from the excessive titillation it occasions; for he immediately after rubs his mouth against the ground, his fore-legs, or sometimes against a tree, with great emotion; till the animal at length finding this mode of defence insufficient, enraged he quits the spot, and endeavours to avoid it by galloping away to a distant part of the field; and if the Fly still continues to follow and tease him, his last resource is in the water, where the Oestrus never is observed to pursue him. These flies appear sometimes to hide themselves in the grass; and as the horse stoops to graze they dart on the mouth or lips, and are always observed to poise themselves dur-

ing a few seconds in the air, while the egg is preparing on the extended point of the abdomen.

When several of these flies are confined in a close place, they have a particularly strong musty smell; and I have observed both sheep and horses, when teased by them, to look into the grass and smell to it very anxiously; and if they by these means discover the Fly, they immediately turn aside and hasten to a distant part of the field.

I once saw in a meadow or field upon the cliffs at Margate, a Fly of this sort teasing a Horse that was confined to a small space by a spike stuck in the ground, to which a cord was tied. He could not get away from its attack, and became quite furious, for in kicking at the Fly with his fore-foot, which he did vehemently, he often struck the bone of the lower jaw, creating excessive pain; for in that direction while grazing the Fly comes to the beard of the lower lip.

The eggs of this species are difficult to be seen upon the Horse's skin or beard, owing to the agitation of the beast, and from the colour of the egg being dark like that of the skin of the Horse. The animal has been generally too impatient, while undergoing this operation, for to let me examine them very well. I ascertained, however, its form by pressing one of these eggs from the abdomen, which had somewhat the appearance and figure represented at 18, having a kind of *petiolus* or stalk to it, and its blunt extremity obliquely truncated and curved.

The Larva or grub of this species inhabits the stomach as the former, generally adhering to the white lining, and is disposed promiscuously in dense clusters, after the same manner; they may however be distinguished from them by being in general smaller, longer in proportion to their bulk, and rounder; and I have thought of a duller red, or more inclining to white, than those of the Equi, for they differ in appearance in different subjects.

This species was more particularly known to Reaumur and Vallisneri, and is the same about which Gaspari was led to propagate his wonderful accounts of the Fly actually entering the body of the animal to deposit its eggs, a thing on several accounts impossible; for, in the first place, it is to be remarked, that no animal of this description is so unwise as to commit an act of severe and deliberate punishment upon itself, and of self-destruction, for all its members must have been broken by passing the strong sphincter of the Horse's rectum; or if the rectum was first protruded, and, as they pretended, entering at this moment, he became enclosed among its folds, he would be so unfavourably situated, being surrounded with slime, wetted, and compressed by the intestine and its contents, he could not certainly perform with the requisite deliberation this important act: but the anus is in fact closed, rather than opened, by any irritation externally applied. The Fly would be crushed in attempting to pass the sphincter of a horse's rectum; and having no means of holding while depositing its eggs, it would be quickly evacuated with the dung; and it is evident that the whole of the *ova*, to the amount of two or three hundred, must be deposited in one horse, as it is impossible, if the Fly survived, that it could undergo this punishment a second time, for the heat and moisture of the rectum would at least destroy its wings, and prevent it from attaining this situation.

I mention these objections, not as merely relating to this species, but that it may not be credited of the *Æ. Nasalis*, or indeed of any of them, that they really enter the body of the animal to obtain for their young a situation there.*

* The fly Dr. Gaspari saw was without doubt the *Hippobosca Equina*, or Forest Fly from the circumstance of its getting beneath the tail, which this Fly often does, and all the rest of the account was added from imagination. That a fly might deposit its eggs on the verge of the anus, is not impossible; but we know of no example or instance of it at present.

On dissection this Larva is found to possess similar air tubes and alimentary canal. When it is ripe, and has passed through the intestines, its skin becomes of a greenish-red hue. It generally assumes the Chrysalis state in about two days after leaving the rectum, and is then of a deep-red colour.—See fig. 19.

The Larva of this species may be obtained from almost any Horse that has been much the preceding year at grass, and exposed to these Flies, and will be found during the summer months sticking more or less within the verge or opening of the anus, adhering to its soft lining, and producing considerable irritation and uneasiness. Indeed I once well remember being on a tour of pleasure in the Isle of Wight, and experiencing much annoyance from these larvæ. The little Horse I had hired for the journey became so lazy and unwilling to go on, and moved so awkwardly, that I could not keep pace with my company, and I was at a loss how to proceed; but on casually taking up the tail, I discovered three or four of these Insects hanging to the rectum, and their removal instantly proved a cure.*

When they are taken away from these parts with a view of obtaining the Fly from them, it should be done with care, and by a light sudden twitch or jerk of the fingers, not compressing them; for if squeezed much in this tender state, (for all Insects are very much so when about to change to Chrysalis,) the Fly is damaged, if not killed: in which case, though they undergo their change to the Chrysalis, it never hatches.

From the beginning of June to the end of July or August, they are found hanging in this way to the end of the rectum, as though reluctant to leave their warm habitation. They appear never to change their skin during their growth, as many other

* Vegetius observes, *Cossi et lumbrici quâ curâ tollantur ad manum*. Diligenter tentabis et invenies vermes collectos exisse in singulis locis et intestinum pertundere ex qua necessitate nascitur dolor periculosus. Digitis evelle eos qui quidem vix evelantur et ipsa tibi in manu coherent, ut difficile eos projicias. Lib. I. cap. 52.

Larvæ ; if they did, it is probable they would lose their hold, as the hooks are principally connected with the skin, and separate with it by maceration, leaving an indentation where they were lodged.

These Larvæ have the power, when compressed or squeezed, of contracting and hardening themselves, and it is probable they in this way resist the violent pressure they must occasionally sustain, from the weight of the food and the actions of the stomach, and in passing through the intestines and the *sphincter ani*.

After remaining in the chrysalis state about two months, the Fly appears.—See fig. 12 and 13,—the male and female,—and their description in the sequel of the paper.

This species may still retain the name of *Hæmorrhoidalis*, without any impropriety, not from the supposed history of its entering the anus, but from the termination of the abdomen being red, Linnæus having generally chosen to distinguish the insects so marked by that name ; also from their resembling the hæmorrhoids or piles, while hanging to the extremity of the rectum.

The learned Charlton, (*Onomasticon Zoicon*, p. 56,) and afterwards Dr. Johnson, (see *Dictionary*,) have considered *ascarides* as the synonymous term among the ancients for the Bots : that term has ever been applied to the thin smooth worms of the intestines, but, I apprehend, never to these.

On the OESTRUS VETERINUS, or Red Bot.

The mode of this insect depositing its eggs or nits, is at present unknown. By watching for them on the commons in the warm days of the sixth and seventh month, (or July and August,) it might be detected, I apprehend, without very great difficulty. They perhaps deposit them about the lips or legs, as the former species. The Larva of this species is also not certainly known.

That it inhabits the stomach as the two former species there is little doubt ; and I have taken considerable pains to search for it at the slaughter-houses, and have found a species in the stomach which widely differs from the *Equi* and *Hæmorrhoidalis*, and which I presume may be the Larva of this. I have given a figure of it at Pl. I. fig. 24 ; though it is possible there may be a fourth species inhabiting the stomach of the Horse, in which case it may be still doubtful, that I do not positively assert it to be this Larva belonging to the *Veterinus*.

This Larva, if it is the *Veterinus*, may be known from the two preceding species, being smaller, of a more tapering or oblong figure, and the segments more detached and rounded, shining, smooth, and of a pellucid red or ruby colour, more particularly at the tail or obtuse end. Although its coat appears smooth to the naked eye, the microscope detects small spines or points in double rows, the two lines alternating ; and these points occur less frequently in approaching the large end, the two last segments being destitute of them. In its very young state there appears to be but a single row of these points, the second row, or that nearest to the middle of the segment being wanting. Two short vesicular palpi appear at the very extremity of the large end, situated upon the lips which cover the air plate.

Through the thin transparent skin of this Larva when very young may be seen the beautiful silvery tubes of respiration, with their numerous ramifications, diverging, closing, bending, and playing among the soft matters within, and accommodating themselves to every movement of the animal.

I have also seen, as I apprehend, another species in the stomach, which I take to be different to any of the before enumerated species, and which is much whiter than the three preceding, being almost perfectly white. I found them forming a cluster in the stomach of a Horse early in the sixth month, or June, and therefore presume they were near their full growth : their whiteness

was opake or milky, with hardly any redness about them, though the last segment was somewhat faintly tinged with red. But there appears in the spines or bristles a peculiarly distinctive character, for they are in a single row only, and regularly placed in a line, and the microscope could hardly discover that their points were black, being minutely so, and hardly visible to the naked eye, while the other species were distinctly so to some distance, in make and other circumstances they resembled the Equi, but were not above half their size. Having stated these circumstances, I leave the further investigation of them to the curious.

The real Chrysalis of Veterinus I once found in the neighbourhood of Worcester, in a meadow below Perry Wood, between it and the city, under some horse dung; and the figure of it was, as near as I can remember, for I threw it away after the Fly came out, much like figure 26, which is done from memory, for at that time I had no prospect of ever having to write on these subjects.

This Fly, after it left the Chrysalis, being confined under a glass in my window, became, if I remember right, singularly active and impatient, and destroyed in its rage one of its wings, drawing it towards its mouth with its legs, and devouring it, as it appeared, and whirling round with considerable velocity and noise upon its back. Whether other flies so confined would do the same I know not.

I think Reaumur's figures I have referred to are certainly meant for this species, but the figures 1 and 2 are evidently two different Chrysalides, though given for the same. The one is of Hæmorrhoidalis or Equi, the other smoother, and probably of this species. Tom. IV. pl. 35. The Larva of this species is not given by him at all, but in the preceding plate there is a good figure of the Larva of the Hæmorrhoidalis, which he considered the same, and the Flies 9 and 10 are the Hæmorrhoidalis, though badly executed. As far as I remember, the Fly of Veterinus, in making

its way out of the case of the Chrysalis, broke away the three or four last segments of the small end, leaving a ragged edge to the opening, but not a regular marginated operculum as given in Reaumur's figure, and which operculum is so remarkable in the Chrysalis of the *Oestrus Bovis*.

This Insect proved a male, fig. 26; and I afterwards in the cabinet of Linnaeus, obligingly presented to my observation by Sir James Edward Smith, found the female, fig. 27, with a short stylus to the abdomen. Some other specimens of this species were found in this cabinet, taken from the collection of Hudson, the ingenious author of the *Flora Anglica*, nearly spoiled, and entangled in the melted wax with which his drawers were covered, as was the custom of those days before the use of cork. A miserable fire consumed his house, and nearly his Herbarium, and occasioned the melting of the wax before mentioned.

Linnaeus supposed this Insect entered by the nostrils and lived there as the other did by the fundament; but as no insect would destroy its own wings, and so miserably punish itself, we have ventured to obliterate the name, that erroneous notions should not be suggested by it.—For its description see the conclusion of this dissertation.

It appears to me that more certain information might be obtained respecting this and the other species that infest the domestic animals, by a very simple method, and which I propose next year to endeavour to prosecute, if my health and present views remain. For this end I propose to procure from the slaughter-houses, and the stomachs of dead horses there, such of these obscure species in the Larva state as it may be desirable to investigate; and since they cannot be fed with any prospect of success out of the body, I intend to inclose them in a ball of meal, and administer them to my own horse, as balls of physic are administered, and in his stomach they will perfect their growth. I next intend to have a stall boarded at bottom and closely jointed, with

a margin round to prevent the escape of the Larva on its falling from the intestines; or indeed, and which would be better, a small apartment entirely constructed for this purpose, of dimensions that would give the horse his liberty, and where he is intended to be chiefly kept during the two or three months of summer. On this floor might the Larvæ, by examining the dung two or three times a day, be collected, and thus fully grown Larvæ being obtained, there would be no difficulty in raising them to the state of a Fly by keeping them in boxes filled with earth, or a mixture of dung and earth, till the Fly appeared. In this way what is unknown of their sexes, species, and history, might be correctly made out, and further on the Fly coming forth, if confined in a suitable apartment, they might even be presented to the Horse, and the mode of depositing their eggs be seen, their copulation having been first permitted, which Vallisneri informs us they are not shy in performing *coram teste*.

I am induced to notice in this place a Fly belonging to this genus, a figure of which is given at No. 28, and whose history we are at present quite unacquainted with. I obtained it, with some other Insects in the sale of Drury's collection, about ten years ago, and by way of distinguishing it till its history becomes known, shall bestow on it the name of *Oestrus Microcephalus*. It may be the *Oc. Trompe* or *Pecorum* of Fabricius, or both.—See the description at the conclusion of this essay. Its general appearance, and the distribution of the tendons of the wing, would lead me to refer it to the *Cuticular Oestri*.

Another species also, whose history we are at present in the dark about, is given at No. 30, which I formerly placed under *Hæmorrhoidalis* as a variety β , but observed that it differed from it in the essential circumstance of having a large white wing-scale: β variat squamâ halterum majori lacteâ magnâ ac facie magis depressâ. Lin. Soc. Trans. Vol. III. p. 328. It has since been taken on the heaths near Plymouth by Dr. Leach, who has

named it *Oc. Ericetorum*, but now conjectures it is no other than the male of the *Oestrus Bovis*.

Its face strongly resembles that of an ape, and the remark in my dissertation above quoted was made from observing this species. “*Frons etiam quadrupedis nonnihil simulat, presertim simiæ : hoc in Oc. Hæmorrhoidali maxime conspicuum est,*” &c. Lin. Soc. Tr. 3. p. 325. The hairs in the upper part of the face also form an arched projection not very unlike the projection of the skull of the monkey over the orbits of the eyes, and the black antennæ sunk in the head, have much the appearance of eyes.—See fig. 32.

On the probable Effects of the GASTRIC OESTRI upon Animals.

Unacquainted with their history, the appearance of inhabitants like these in the living stomach, would, to superstitious people, or even in strong minds, produce apprehensions of their pernicious or fatal effects, especially when they saw the coats of the stomach eroded as it were in holes nearly through by them ; yet but few horses exposed on the commons can escape having them, and the perfect health they enjoy with them is a proof sufficient of their innocuous nature and harmlessness in a general way.

That the coats of the stomach are not particularly irritable to mechanical stimuli, is proved from daily experience by offences committed against them. Some kind of fishes have their stomachs completely perforated through by the bones of the fishes they feed upon, without any derangement of their health, or probably much sensation ; and the white tissue of the Horse's maw is certainly less sensible than the other parts of the stomach, that it is fair to conclude our apprehensions of their effects have been carried much too far : if the tone of the stomach should be changed by inflammation or other disease, their roughness might

perhaps become then very sensibly felt, and their powers be changed. That they contribute to health in some degree is, I think, very probable, for notwithstanding the apparently unnecessary existence and cruel effects of the Oestri, they are probably not altogether without an use, and were not designed by Providence to add, without a recompense, to the numerous sufferings of these useful and laborious creatures.

A physiological view of their effects will, perhaps, best justify their existence, and save them from such an imputation.

To see the full purpose of their existence may not be within our power in our present state of knowledge, yet we nevertheless may introduce some remarks in this respect as a foundation, and whether a permanent one or otherwise, we shall not be tenacious about; they may, at least, lead to further consideration and research concerning them.

Throughout nature the benevolent design appears of leaving no place idle or unoccupied, that can conveniently or usefully afford a home and happiness to some being suited to it, and which sometimes, in its turn, may also be made to contribute to the welfare of the animal it is given to infest.

These parasite animals, though uncouth and almost of themselves a disease, may prevent the access of worse diseases, and in such situations as would produce them of a fatal nature, and prevent it by their local effects. Children of cachectic habits breed worms faster than healthy children, which may tend to suppress or moderate the disease they incline to; and sheep, in low damp situations, which might produce a worse disease, become in these situations particularly infested with these parasitic animals. Linnaeus, in respect to *Pediculi* or *Lice*, has admirably observed, "*Rodendo caput exciat achores apud puerulos voraces in-carceratos indeque strumosos et sicque preservat a coryzâ, tussi, cacitate, epilepsiâ,*" &c. That is, that Lice, by gnawing or irritating the skin of the head, excites a sort of running sores amongst boys

kept in filthy workhouses, or confined places, and become strumous or swoln by the confinement, by this excitement are preserved from coughs, wheezings, blindness, epilepsy, &c.—In more cleanly situations they would not be subject to one, nor then would they be so obnoxious to the other, or in any considerable degree however. Some constitutions, inveterately subject to the *morbus pediculosus*, would perhaps serve to confirm this remark; also by their having a strong tendency to some disease which these animals may tend to avert, and in which constitutions the facility of their propagation becomes in a wonderful manner increased so as to almost defy their eradication, which in stronger constitutions, and free from disposition to disorder, would not be the case. These Gastric Oestri, perhaps, in a state of health, without producing the terrible consequences usually apprehended, may tend to preserve it by their gentle stimulus to the stomach, and by promoting the digestion of their low watery food, prevent the cholic, gripes, and other indigestions which ultimately affect the head of the Horse, and producing staggers, a disease the horse is particularly subject to.

Nor is there wanting abundant proof of the utility of local irritations in preventing the access, as well as in curing disorders. We often see a formidable disease quickly removed by blistering the skin, or by irritating the mucous membrane of the stomach or intestines by a vomit or purge. The appearance of exanthematous eruptions on the skin, and the formation of local abscesses, from the same cause of partial irritation, often relieve a general disorder of the system. The mucous membranes and the skin possess this power when irritated in the most eminent degree, and to these the Larvæ of the Oestri are applied. Irritating the membranes of the stomach in other animals would excite nausea and vomiting; but the Horse not possessing this power, his stomach is peculiarly fitted for the stimulus of such inhabitants.

It has also been remarked in hospitals, that a patient afflicted

with a wound, ulcer, or other severe local complaint, is not so susceptible as others similarly exposed to the contagion of a fever or other general disorder.

How far the access of those dreadful disorders which sometimes arise of themselves in cattle and horses, and afterwards become contagious, as the murrain, glanders, farcy, &c. may be prevented by these peculiar irritations, it will not be easy to discover; nor whether that singular tendency or disposition in the Horse to inflammatory complaints, as the *caligo* of the eyes, termed moon-blindness, inflammations of the lungs and of the bones, as spavins, splints, &c. may be in any degree checked or subdued by the presence of these local *stimuli*.

In confirmation of this suggestion I may remark (although I am aware other reasons may be also assigned for it,) that those Horses which are not exposed to the Bots, more frequently are infected with the glanders, farcy, &c. as those of the army, post-coaches, post-waggons, and dray-horses, for these can rarely be spared, from the nature of their work, to graze on the commons, and thus be exposed to receive them.

If, after a more minute research into their effects on the system, the utility of these native stimuli of animals should be established, and, like the leech, or the cantharides, they should be called in to the aid of veterinary medicine, I may venture perhaps for the first time to suggest that it would not be impracticable to administer them artificially by means of their ova or larvæ in any given quantity.

If the stimulus is considered as of too gentle a nature, it is in some measure atoned for by its permanency, and the unlimited power of increasing the dose; at least it must be acknowledged that by the administration of them in this way, we might accurately ascertain their real effects, and whether they are so fatal as has been imagined.

Desirous that my horse, which had not been to grass for some

years, should have their wholesome stimulus, I cut off the hairs from another horse charged with the Bot's eggs, and gave him about three dozen of them. He afterwards grew fatter, and in better condition than I had ever known him, whether from their effects or not I do not undertake to determine, but think it not improbable they contributed to it.

In Nasal Farcy Gleets of Horses, I have followed this suggestion of stimulating the stomach by Cantharides in small doses, and by the Sulphat of Zinc, with great success, curing several that were considered glandered.

The domestic animals in a particular manner appear to be the objects of this species of natural stimuli or vellicatories, which as they are also frequently forced by man into unnatural exertions and unhealthy situations to suit his views and convenience, so therefore they may stand more in need of this sort of protection. Their impressions may be hardly cognizable to the senses, and produce nevertheless powerful effects upon the stomach, and thence to the system at large, as we see in the case of spices given with food, and fomentations, mild blisters and sinapisms to the skin.

How dirty in warm climates would men become, if it was not for the fear of the increase of vermin, that they can stimulate to industry therefore is certain, and so to health. Animals would become inactive in warm weather, perhaps fatally so, if it was not for the stimulus of flies and other insects, which by teasing prevent it.

Those who consider the Bots as a plague would no doubt be desirous of being informed how they should best destroy them. One great utility in the study of natural history is, that it affords us a knowledge of the habits of these animals, and by these we are taught the most effectual measures for this purpose. It is indeed truly difficult to detach them from the stomach by any medicines or poisons administered internally, though there are not

wanting abundant nostrums for this purpose among the numerous professors of horse physic. At the natural annual period of their transformation they come away readily enough of themselves ; and if it happens at the time that any medicine has been exhibited, it is considered as proof enough of its efficacy, and mistaken for the consequence of it ; so easy is it to draw wrong conclusions. Neither opium or tobacco given for several days have any effect upon them, as I have witnessed by opening the stomach after the death of such, and finding them lively and well. We can, it is true, force the poison down the horse's throat, but we cannot afterwards get it into the throat of the worm, who is placed in his own element, and can refuse the food that does not suit him. Truly is it therefore difficult to destroy them by means of poisons thrown into the stomach.

Oils, to close the pores of respiration, and thus kill them, was a favourite suggestion of the last age for worms of all kinds, and it was thought *must infallibly kill them* : nevertheless it did not. These oils probably in the stomach are soon reduced to a soap, and digested ; how much less then could it affect worms situated in the intestines.

The wisest measure for securing animals from their effects is to prevent their propagation or access, and their habits expose to us an effectual mode of doing this. The eggs of the *Oestrus Equi*, which are very conspicuous on the knee, the mane, and the sides of the horse, may be washed off by a brush and warm water, or still more effectually removed by a pair of scissars. The same may be done for the *Hæmorrhoidalis* from the lips and beard.

The other species being smaller, more rare, and probably less troublesome, require therefore less our consideration.

In respect to the *Hæmorrhoidalis* also, where horses have been much out at grass the preceding year, they should occasionally in the warm months of the next summer be examined for them, when they will be found, as we have already stated, hanging to the

extremity of the rectum, and should be removed by the fingers. The destruction of a single one at this season of the year is not only the death of an individual and its effects, but the almost certain destruction of a numerous progeny; it is also useful in preventing the irritation which the spines of the Bot occasion to the anus, which irritation becomes very distressing to the animal if he is used on the road, occasions him to move awkwardly, wriggle himself about, and to be sluggish, and though beaten severely he soon relapses again into his awkward manner of going; which as this happens generally in warm weather, is most commonly attributed to mere laziness.

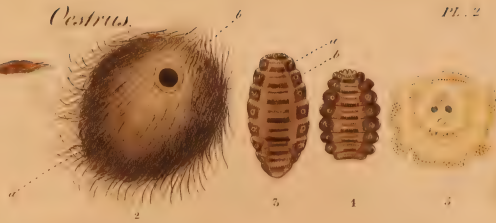
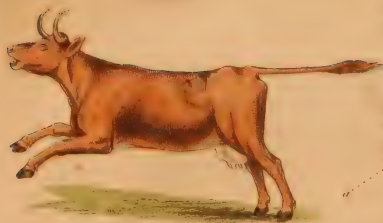
Some further remarks on their probable effects we leave till we treat of the Cuticular and Cavicular Oestri.

* * *Second Family, CUTICOLÆ.*

The OESTRUS BOVIS, or GAD FLY.

Of all the European species of this genus, this is the largest, and is not unfrequently seen in country situations in the backs of oxen and cows. They form tumors as large as pullets eggs on the sides, about the back and loins. See their appearance, Plate II. fig. 2, *a* the tumor or abscess, *b* the external opening. With us among the country people they are called Warbles, Wornils, Wormuls, and sometimes Bots.

When I first took up the investigation of these animals, I was in considerable perplexity what this species could be, since I possessed the *Oestrus Bovis* of Linnæus, agreeing perfectly with the description, and which was a Horse Bot; nor had I then seen the writings of Vallisneri or Reaumur, which, as Linnæus had seen and referred to, I did not suppose could have fallen into such an error as to have omitted entirely this remarkable species, or have confounded it with the *Equi*, but it so proved, and on obtaining the perfect insect from the back of the cow, the mys-



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Bovis

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12



Taranuli

13



larve



14

*** Cavicolae



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18



Ovis

19



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21



22



23



24



25



26

Horripilum



27

Cauterium



Cuticuli

28



29

Parivora



30

Cuterebra



tery became unravelled; for I was not certain, indeed apprehended after such authority, that the same species inhabited both animals as Linnaeus had stated, "*Habitat intra Boum dorsum, in ventriculo Equorum saepe ipsis lethalis.*" *Lin. Syst. Nat. p. 969.* This insect was not known to Linnaeus, and, indeed, has been rarely seen; Vallisneri, after years of labour, procured only one mutilated specimen of it; and Reaumur, after great pains and expence, only two or three. A mode of obtaining this fly, which succeeded with me perfectly well, I shall now describe, by which I obtained out of three larvæ two perfect flies, one so perfect, that it flew away while I was making some experiments in presenting it with different objects; the other I gave to Thomas Allen, Esq. after drawings had been made from it for the use of the Linnæan Society. One I also fortunately caught of these flies, between Salanche and Bonneville, in Savoy, flying in the road, and settling on some dung where cattle had recently passed; this specimen, on my return through Germany, I presented to the venerable and worthy Professor Daniel Schreber, of Erlang, the intimate friend and pupil of Linnaeus, who till then had not seen it.

The following is the simple means for obtaining them perfect, which may be not unacceptable to those who for their cabinets or from curiosity may wish to see them:

During the latter months of the summer, about which time the larvæ are found fully grown, and about to quit their habitations, which can be known by the superior size of the abscess, and especially the increased diameter of the external opening; such being selected for the experiment, we remove the hairs round the tumor to a considerable distance with a pair of scissars as close to the skin as may be; and a piece of leather, thickly spread with pitch, being provided, through the center of which a hole is cut about the size of the finger, and into this a small gauze pouch or bag is inserted, hanging out an inch or two from the leather: this plaister with its pouch is then placed upon the

skin, to which from its warmth, which is very considerable, it readily adheres, the pouch being opposite the opening. Whenever the insect makes its way out and falls from the abscess it is caught by the bag, in which, as it cannot escape, it remains till removed by the person looking after them. The larva thus obtained, as it is full fed, will hardly fail to produce a perfect fly; it is only necessary to put it into a pot with some loose light earth for it to change upon.

That we may continue the history of these flies with some degree of uniformity, we shall commence its operations with some remarks on the deposition of the eggs, as we have done with the former species. This act appears to be attended with severe suffering or apprehension at least, which makes the cattle run wild and furious and gad or stray from the pastures; and hence the ancient epithet of Gad-Fly. When yoked to the plough, the attack of this Fly is attended with real danger, since they become perfectly uncontrollable, and will often run directly forwards through the hedges, or whatever obstructs their way. There is provided on this account, to many ploughs a contrivance immediately to set them at liberty. When the cattle are attacked by this Fly it is easily known by the extreme terror and agitation of the whole herd; the unfortunate object of the attack runs bellowing from among them to some distant part of the heath or the nearest water; the tail, from the severity of the pain, is held with a tremulous motion straight from the body, and the head and neck stretched out to the utmost. The rest from fear generally follow to the water, or disperse to different parts of the field. See Plate II. fig. 1.

And such is the dread and apprehension in the cattle of this Fly, that I have seen one of them meet the herd when almost driven home, and turn them back, regardless of the stones, sticks, and noise of their drivers; nor could they be stopped till they reached their accustomed retreat in the water.

The strongest and healthiest beasts seem to be preferred by this Fly ; and with the dealers in cattle their possessing them is held a criterion of goodness. The tanners, also, observe their best and stoutest hides have the greatest number of Bot-holes in them.

It is not yet satisfactorily ascertained, whether this alarm is the effect of an instinctive fear of the Oestrus ; or whether, in depositing the egg they inflict a painful wound ; or if there is a sound given by the Fly which is frightful to them. The scale at the base of the wings of this Fly is remarkably large ; and this part has been supposed by Keller, and other writers on this subject, to be the organ of the sound or buzzing we hear from these animals. This magnitude of the wing-scale would favour the opinion of Virgil of their attack being accompanied with a noise "asper, acerba, sonans," &c. Those, however, I saw in flight made not the least sound that I could perceive ; still it may be true, that in the act of inserting the eggs, from certain feelings or emotions accompanying this act they may be led to do so. In the Rhein-deer Gad-Fly Linnæus saw the egg protruded and held out upon the point of the abdomen, like a white seed, ready to be placed upon the skin of the animal ; he makes no mention of any sound accompanying it in this Fly, and this circumstance of the protrusion of the egg would lead us to infer, that no wound is inflicted by the Fly, whose tail, like the tube of a telescope, piece within piece, appears of a nature no way calculated for such infliction. The *Ichnemon Fly*, we know, deposits its egg upon the naked skin of the caterpillar, which egg adheres strongly to the skin, as though glued to it ; and the little grub, on the hatching of the egg, makes its way through the skin into the body of the caterpillar, and there feeds till ripe ; and it is equally possible, that the skin of the ox is perforated by degrees by the young larva of the Gad-Fly, till it obtains its situation beneath the hide. The animal is so frightened that it has not the

power of lashing them off with the tail. Sometimes horses, also, are attacked by the Gad-Fly, and I have been witness to four or five instances of these larvæ being found beneath the skin of the horse, the parent Fly, driven perhaps by necessity and the want of proper opportunity of depositing it among the cattle: whether they ever arrive at maturity in these cases I am not assured.

The larvæ of the Cuticular Oestri are very unlike the Gastric larvæ, so much so, that I could hardly imagine that they would produce an Oestrus till I actually procured the Fly from it.

Removed from the abscess this larva is found of an oblong figure, larger at one extremity than the other, which larger end is placed upwards in the abscess, has the respiratory plate, and is applied to the external opening of the abscess. The body of the larva is divided into ten or eleven segments or sacculi by transverse bands; these are crossed again or intersected on the sides by six longitudinal lines, pursing up the skin, and forming the sides of the larvæ into so many papillæ or nipples, each possessing at its extremity a respiratory pore. See Plate II. fig. 3. These larvæ have not the long acula upon the edges of the segments, as in the Horse-Bot; but they have an apparatus which serves much the same purpose, but in a milder degree, for there are observable on a more close inspection, ridges of dotted prominent lines passing transversely round the body of each segment, and interrupted irregularly by the longitudinal lines above described, leaving smooth intervals between them: of these there are two kinds, a narrower and a broader line of minute dots or points; the first, or narrower line, is easily seen by using a lens to be formed of hooks bent upwards or towards the tail of the insect. See fig. 3. *a*. And on examining the broader lines, consisting of smaller dots, fig. 3. *b*. with a powerful magnifier, they also may be seen to consist of hooks, but smaller, and turned in the opposite direction, or downwards in the abscess, and towards the head of the insect. It is probable, by means of

these hooks, erected by the muscles of the skin, the animal raises or depresses himself at pleasure, or turns about in the abscess and finally crawls out of it when ripe. The use of the terminal tentacula, observable in the Gastric species, would have been useless in this, as the oval form of the abscess retains them in their abode sufficiently secure. And by the motion of the larva in the abscess these hooks, by irritating the surface of the sac, produce a discharge of pus for sustenance.

In what manner the nourishment is received by this larva is not immediately discoverable. Indeed, it was not known to me till an unexpected circumstance led me to its discovery; on immersing one of these larvæ in warm water with a view to rid it of pus and slime, I observed a considerable quantity of pus to be ejected from an aperture, which at other times was closed, this was at first considered to be the mouth; it, however, was found on further research to be the real anus of the larva, for it is in the upper part of the larva, or that end which is applied to the external opening in the skin, (where may be also observed two small horny plates,) which are found on dissection to close the extremities of the trunks of two large air vessels. Near to these plates, and somewhat above them, this minute puncture is discernible. At other times, when closed, it was discernible with the utmost difficulty. At fig. 3. is represented this aperture, *a.* together with the two horny plates, which close up the air vessels, being a view, very considerably magnified, of this upper extremity of the larva.

From a first view, this part would appear to be the head of the larva, being uppermost in the abscess; but as it is found to produce the extremity of the abdomen in the future insect, it must, therefore, be considered as the tail; and the above-mentioned minute aperture is undoubtedly the anus, and is found to be in conformity to the same situation of the anus in others of this

genus. And this would seem to render it manifest, that through these plates they receive the air, and emit it by the spiracula.

At the lower end of the larva, fig. 3. a small indentation may, with attention, be observed, which is the mouth of the larva. It is a simple aperture, and altogether unprovided with any of the apparatus belonging to the mouths of larvæ in general; and near the mouth are seen two black points of horn, which appear to be perforated in the centre, and are found by dissection to be the termination of two considerable branches of the air tubes, and correspond to the two nipples on the first segment of the larva of the *Æ. Equi*. An enlarged view of the mouth and inferior part of the larva of the *Æ. Bovis* is seen in fig. 4. Round the orifice of the mouth are placed some projecting mamillæ, which are imperforate, and perhaps serve the purpose of feelers.

The intestinal canal in this larva is a simple membranous tube, which extends from one extremity to the other, and serves the double purpose of stomach and intestine.

In the larva of the *Oestrus Bovis* there are only two principal trunks of air vessels, which are connected near their origin by a lateral trunk. From these trunks branches are seen passing in every direction through the parenchyma or matter of the body of the insect, some going to the intestine, others to the skin, and a greater number appear to be forming an anastomosis with each other.

When young the larva is smooth, white, and transparent; as it enlarges it becomes browner; and about the time it is full grown it is totally of a deep brown colour.

The larva having attained its full growth and size, effects its escape from the abscess by pressing against the external opening, which occasions its enlargement by the points pressed upon being absorbed, and the skin also may give way and extend itself under their impression. When the opening has obtained the size of a

small pea, the larva writhes itself through, a ring or segment at a time, till arriving at the narrower part of its body it falls out, and tumbles to the ground, and seeking a convenient retreat becomes a chrysalis.

After leaving the abscess, and preceding their change, they contract themselves into a much smaller space, and assume a different figure. See Plate II. fig. 4. They never change or throw off their skin, apparently, but the same serves them through their whole growth, and at length also forms the shell of the chrysalis, as in the other species of this genus.

If we examine the sac which enclosed the larva beneath the skin, it appears formed of condensed cellular membrane, and is rough on the inside. The pus secreted is mostly of a yellow colour, and sometimes flows from the opening, and dries about the orifice. After the exit of the caterpillar the abscess disappears, and the wound in the skin closes up and is healed in a few days: but although the skin heals up on the exit of the larva, we may remark, that the union is not so firm as was the original skin, but is affected by a sort of agglutinating deposit, which afterwards on the skin being dried and hammered by the tanners gives way and cracks again in these places, shewing the union to have been of a less perfect nature than the original skin; the succedaneous nature of the repair of broken skin, has been remarked by late physiologists, and we mention this fact as confirmatory of their doctrine.

The chrysalis is of a dark brown colour, and in figure somewhat resembles the half of a walnut shell, being narrower at one end than the other, and flat on one side, and very rounded and convex on the other. See fig. 6. Those which I bred remained in the state of chrysalis from the latter end of June till about the middle of August, when the Fly appeared. I have, notwithstanding, observed full grown larvæ in the backs of cows as late

as the ninth month, or September, which must have produced their Flies as late as November or December, or perhaps not till the ensuing summer.

The larva after being immured in the chrysalis a sufficient time, and its soft members dry and in a degree hardened, bursts from its confinement by forcing open a very remarkable triangular lid or operculum, see Plate II. fig. 7. and makes its way out at the small end, *a*. The position and appearance this Fly makes in the chrysalis is also given.

The larva at the period of making its way from the back of the beast is weak and tender, and exposed to imminent danger, if on land, of being trod on by the cattle or picked up by birds; if on the water, where the cattle stand during great part of the day at this hot season of the year, it perishes by drowning or becomes the food of fishes.

It is worthy of remark, that Reaumur has stated that its escape from the back of the beast usually takes place at a very early hour of the morning, at two or three o'clock, or at sun-rise, now if it be so it is remarkable that in this way much of the danger is avoided, as the animals at this time would most probably be upon dry land, and in a more quiet state than at mid-day, and the birds also would not then be present.

The Fly thus singularly produced, is large and handsomely coloured, see fig. 8. and 9. Plate II. and its description at the conclusion of this Essay; its wings and tendons, fig. 10. and the abdominal stylus of the female for depositing the eggs, according to Reaumur's drawing, fig. 11. To the extremity of the abdomen of a specimen of the *Oestrus Bovis* which I possess, there is something visible like a hard white stylus, or rather spine, of whose nature I am not assured.

As to their effects, they may be perhaps not inaptly considered as the living rowels of the ox, producing in all respects the same

effects as an artificial inserted rowel, issue, or seton, would do; and these perhaps first suggested in ancient times to practitioners in medicine these very useful remedies.

The cattle are subject at times to violent cephalic disorders and epidemics, especially in the warmer climates, which these natural cutaneous irritants or suppositories, as they may be called, may tend to avert; and they may operate in a more forcible and determinate way, in producing all the effects of the Gastricolar Oestri, already noticed, the skin having such a general sympathy.

In respect to the riddance of them where they may be conceived mischievous, we may observe, that the larva of the Oestrus Bovis, which breeds in the backs of horned cattle, is so conspicuous, that it is more easily destroyed than the others: the injection of any corrosive liquor into the sinus would kill it; or by puncturing the larvæ with a hot needle, introduced through the apertures in the skin, or even by simple pressure, they may be destroyed, afterwards extracting them, or leaving them to slough away, which I have frequently observed they do when crushed by a blow from the horn of the beast, or by any other accident, without any material injury to the animal. A man employed for this purpose might, in half a day, in this manner destroy every bot on a large common, the beasts being suffered to pass one at a time in review before him.

Of the OESTRUS TARANDI, or Rhein-deer GAD-FLY.

The Rhein-deer delights in the cold of the north, and appears destined most beautifully to fulfil by himself to the polar inhabitant the various offices of the horse, cow, and sheep, of the more southern regions, carrying burdens, giving milk, and affording clothing: and this worthy animal appears in a remarkable manner to suffer from the effects of the Oestrus, with which he is infested, more than the other domesticated animals, so much so, as to occasion

the Laplander to quit his abode several months of the year, and oblige him to go with his Rheins into the Upland Alps, in order to avoid their effects. The gnats or mosquitoes also, in these regions are more troublesome than in any other part of the world; so that not only the rigours of the climate, the unproductiveness of the earth, and the hard condition of life, but the very insects appear to contribute to drive men from these situations into more hospitable latitudes.

The Rhein-deer Bot had attracted very little notice till the writings of Linnaeus presented many interesting details respecting them to the lovers of natural history; and from his various scattered notices or memoirs we have extracted the following details:

In the *Flora Lapponica*, p. 360, in describing the Agarics and Lichens of this part of the world, he introduces his remarks on the Rhein-deer Gad-Fly; as the Rhein-deer is chiefly fed during the winter on one of these, the *Lichen rangiferinus*, which is very abundant in the north, as though provided for them, and is serving perhaps in some instances also, as a covering from the inclemency of the weather to vegetables.

He afterwards in a sort of journal of his tour, written in Swedish in the *Acta Stockholmia* for 1739, p. 119, gives further particulars of their history. And in the *Acta Upsaliensia*, 1736, p. 102, he enters again on this subject with some variations.

Their depredations he describes as most bitterly felt by the inhabitants of these regions; and after a few pious and admiring reflections on the ways of Providence in providing for these Flies in their delicate and tender larva state, he observes, that in his journey into Lapmark in the year 1732, he found all the inhabitants had quitted their plains and woodlands for the hilly country and Alps. One only he found dwelling there with his Rhein-deer (Rhen), whose horns, soft, tender, and sore, were miserably punctured by the Tabani till they distilled blood; and that the gnats also joined in the persecution with their little trunks con-

tinually infesting them. The animal, to avoid their effects, would prostrate himself before the little hut of the Laplander, and be secure from the teasing of his enemies by the smoke of the burnt agaric, which proceeded from it.

On passing afterwards into the Lapland Alpine country he observed a Rhein-deer, loaded with his own pack, frequently to stop short and become suddenly quiet and motionless as a pillar of stone, or one struck with catalepsy, the head held out straight, the ears upright, and eyes fixed; nor by any ill treatment could he be induced to proceed, but in a little while he would again resume his march.

Early one morning, while he was in bed between two skins of the Rhein-deer, he perceived a very ungrateful stink, when daylight appeared there were standing about the cot a thousand of these Rhein-deer, driven by old men, young boys, dogs, and women, who milked these animals. They appeared to be under the apprehension of some invisible attack. The animals carried their heads aloft, their ears pricked up and extended, beating the ground and kicking in the air with their feet, as though by enchantment; then for a while they would be quiet, then again they were seen most furious, and this with so general and regular a movement, that no army would have surpassed their exercises in uniformity. On asking the Laplanders the cause, they told him it was these Flies.

Anxious to ascertain the truth of this, he was able with nice observation and scrutiny, to perceive flying backwards and forwards in the air some of these Flies, which he endeavoured to catch, and assisted by the Laplanders succeeded in taking four or five, which he sat down with pen and ink, greatly to the amusement of the Laplanders, to describe, which occupies the remainder of this pleasing essay, and which we shall give with the others at the conclusion.

He observes, that those which he took had no weapon at the

extremity of the tail for inflicting a wound, nor was there in the mouth any aculeus ; that their effects upon the Rhein-deer in so driving them did not admit of explanation. He describes the abdomen as having a telescopic tube at its extremity, which is probably similar to the one already given with the *C. Bovis*, and is peculiar to the female, as in other Flies. On observing the tumors in the back a few weeks afterwards, that had been touched by the insect, he found an opening that would admit a goose quill ; he squeezed these tumors with his fingers, which the animal could but badly endure, but he persisted in pressing them till he made the larva come out through the opening, which he describes as being white, of an oval figure, extremely tender and delicate, the extremity black, which presented to the opening. The body with circular folds and curved lines.

One of these flies he describes as following the rein-deer that carried his clothes, and was always near or upon the animal ; she had her tail held out, and carried rather to one side and curved upwards, and upon its extremity a white egg, as large as a cynips, or hemp seed perhaps. I had (he says) an opportunity the whole day of seeing this insect continually following him, and sometimes going before him ; and so careful was it about depositing its egg, that it did not care to place it upon the rein-deer if it did not stand tolerably still, but dropped it on one side ; and so persevering was it to follow him, that at last it became exhausted and fainted away, and fell down on the snow mountain with fatigue, so that it could be taken with the hands, but shortly after, when it had been a minute on the snow and recovered itself, it flew to the next green spot, where it rested, and then again pursued the rein-deer.

It was curious to observe the striving of the dogs, the boys, and the rein, which would run many times round the hut of the Laplander, before it would proceed to the pasture where it was to feed, if with the wind, but against the wind the rein would proceed with alacrity, for by his flight when proceeding in this

direction he could outstrip the fly which, forced back by the current could not so easily follow him. At break of day, and in the evening, it was curious to observe these conflicts. He observes how admirable it is that these Insects are secured from the cold by their provident Creator, by the dense warm covering, and the thick matted long hairs of the Rhein-deer's back, and that the back and not the sides is chosen for their nidus, otherwise the animal by lying down would crush them. And the long hair of these animals in summer, standing upright, and detached as it were from the skin, enables the Fly to deposit her egg between, on the more exposed and naked parts. And the times of their formation in the backs is the time of the rhein-deer shedding his horns; and the stumps being then soft and tender, prevents his destroying them. Linnæus also compares its effects to that of a fontanelle or issue, formed by a pea in the human subject; and how wonderful, he observes, it is that so large an animal, which might defy the strength of man, cannot nevertheless defend himself from, or resist the attacks of this small Fly.

He says that a third part of the rhein-deer, if I understand him rightly, are destroyed by this fly, occasioning the disease the Laplanders call *Curbma*, the name they give to this fly. Their effects perhaps in this respect are exaggerated, and the deaths, from whatever cause, too easily attributed to this troublesome insect, as the death of horses has been too often to the Equi, by the ignorant.

Some farther circumstances respecting them appear in the *Lachesis Lapponica*, or Lapland Tour of Linnæus, the translation of which from the Swedish has been lately published by Sir James Edward Smith, Vol. II. p. 38:—"These animals are sometimes attacked with a vertigo or dizziness in the head, which causes them to run round and round continually. The people assured me, that such of them as run according to the course of the sun, may be expected to get the better of the disorder; but those

which turn the contrary way being supposed incurable, are immediately killed. The recovery of the former is thought to be promoted by cutting their ears, so as to cause a great discharge of blood.

“ The *Kurbma* or ulceration caused by the Gadfly takes place every spring, especially in the younger fawns. Such as are brought forth in the summer season are free from this misfortune in the ensuing spring; but in the following one many of them lose their lives by it. When come to their full size and strength, the consequences are less fatal: but no rhein-deer is entirely exempt from the attacks of this pernicious insect.

“ Such of the male rhein-deer as are destined to serve for a stock of provision are killed before the rutting time, and their carcasses hung up, exposed to the air and frost before flaying. The flesh is smoked, and a little salted, and then laid upon sledges to dry in the sun, that it may keep through the winter till spring. About the feast of St. Mathias (Feb. 24) the rhein-deer begin to be so incommoded by the Gadfly, that they are not in a fit condition to be slain for eating. From that period therefore, till the milking season, the Laplanders are obliged to live on their stock of preserved meat. At other seasons of the year the females are killed for immediate use, according as they are wanted.” Vol. II. p. 42.

Other particulars are also given in these volumes, but as they were derived from the mistaken information of these untutored people, I forbear their insertion; and Linnæus himself had omitted them in those communications quoted at the beginning of this account, probably from suspecting their correctness.

At fig. 12 is seen a sketch of this interesting animal; 13 and 14 views of the *Oestrus*.

Linnæus has remarked, that the *Buphaga Africana* draws forth these larvæ from the backs of the oxen. Syst. Nat. I. p. 154. And in the *Amœnitates Academicæ* is found also a repetition of the

above details respecting the Oestri, Vol. IV. p. 157 ; and where the same circumstance is asserted in respect to the crows also drawing them out from the backs of the rhein-deer : *Cornices prosequuntur Rhonem ut Oestros dorso inharentes extrahant et deglutiant, quod quamvis Rheno non facile admittit, fatigatus tamen, ferre saepius coactus est ut mihi narravit Dn. Er. Fiellstroem in Lapponia ipse natus.*

*** *Oestri Cavicolæ, or Face-Bots. Of the OESTRUS OVIS, or SHEEP-BOT.*

The eggs of this species I have not yet seen, the sheep being very shy under their attacks, which renders it difficult to approach them near enough to see the actual operation ; the obscure colour of the fly also adds to the difficulty. The sheep are exceedingly annoyed with them, and to defend themselves get into the roads in dry hot weather, and lie down along the dusty ruts, holding their heads close to the ground, which makes it difficult for the fly to get at them ; at other times one finds them standing up, with their heads held low, almost to the earth, and the nose turned between the fore legs, their nose being nearly in contact with the ground. This mode of defence must render the attack of the fly exceedingly difficult ; at other times, when in the open field, they congregate together, forming a dense compacted mass or phalanx, which, except to the exterior ones, is scarcely accessible to the fly, the noses of the greater part of them pushed against each other, or held nearly close to the ground ; in this way those placed in the centre must be very secure.

The manner in which this species deposits its ova, has not, I believe, been described ; nor is it easy to see, though close to the animal at the time, exactly in what way this is accomplished, owing to the rapid motion and obscure colour of the fly, and the extreme agitation of the sheep ; but from the actions of the sheep

afterwards, and the mode of defence it takes to avoid it, there is little doubt that the egg is deposited on the margin of the nostril. The moment the fly touches this part of the sheep, they shake their heads, and strike the ground violently with their fore feet, at the same time running away, and holding their noses close to the ground, and looking about them on every side to see if the fly pursues, and as they go along they often smell also to the grass, and look anxiously into it, lest one should be lying in wait for them; if they observe one, they gallop back again, or take some other direction. As they cannot, like the horses, take refuge in the water, they have recourse to a rut, dry dusty road, or gravel-pit, as a defence, as we have before remarked. Pl. II. fig. 16.

Observations on these flies are best made in dry weather, and during the heat of the day, when by driving the sheep from their retreats, the attack of the fly and the emotions of the sheep are easily observed.

I imagine the nostril becomes highly inflamed and sore, from their repeated attacks, and the consequent rubbing of the nose against the ground, which, together with certain instinctive apprehensions of these flies, occasion their touch to be so much dreaded.

From the difficult and precarious mode these *Oestri* pursue in depositing their eggs, they cannot succeed in depositing but a few in each sheep; whereas if on the contrary they actually entered those cavities of the face to effect it, they must deposit them all, and in one subject, the improbability of which in respect to the other species is already stated.

Of the Larva. From one to seven or eight are generally found in the cavities of the face, what are called by anatomists of the human, the maxillary and frontal sinuses, but which in quadrupeds are cavities of considerable extent and magnitude, and the thin flexible bones which constitute them are covered with a

dense white membrane, upon the secretions of which they feed, and these membranes are found more or less inflamed by their presence.

Vallisneri has remarked, that Alexander Trallicen, a famous Greek physician of the sixth century, relates the following anecdote, which has an undoubted reference to these larvæ, that "Democrites, an Athenian, being subject to fits of epilepsy, determined to consult the oracle at Delphos for a remedy, and received for answer,

" Quos madidis cerebri latebris procreare capella
Dicitur humores, vermem de vertice longum."

An old man of eighty years, explained to him the fact of the existence of such worms, and pointed out the means of obtaining them by a sack tied about the nose of the sheep, into which they were received on falling from the sinuses. And this way also was employed by Vallisneri and Reaumur.

When young these larvæ are perfectly white and transparent, except the two horny plates, which are black. As they increase in size the upper side becomes marked with two transverse brown lines on each segment, the anterior one shorter and narrower than the posterior; and some spots are also seen on the sides. The body consists of eleven segments. See fig. 17.

I procured about the middle of June some full-grown larvæ of the *Œ. Ovis*, from the inside of the cavities of the bone which supports the horns of the sheep. They are nearly as large as those of the *Œ. Equi*, of a delicate white colour, flat on the under side, and convex on the upper; having no spines at the divisions of the segments as the *Gastricolæ*, but are provided with tentacula at the small end. The other end is truncated with a prominent ring or margin, which serves the same purpose in an inferior degree as the lips of the *Œ. Equi* and hæmorrh-

hoidalis, by occasionally closing over, and cleaning the horny plate, from the mucus and pus of the membranes, with which it is subject to be smeared and prevented from performing its office. When this margin opens after closing over the plate, it occasions frequently a slight snap from the sudden admission of the air.

They move with considerable quickness, holding with the tentacula as a fixed point, and drawing up the body towards them. On the under side of the larva is placed a broad line of dots, which, on examination with glasses, appear to be rough points, serving perhaps the double purpose of assisting their passage over the smooth and lubricated surfaces of these membranes, and of exciting a degree of inflammation in them where they rest, so as to cause a secretion of lymph or pus for their food.

I have mostly found these animals in the horns and frontal sinuses, though I have remarked, that the membranes lining these cavities were hardly at all inflamed, while those of the maxillary sinuses were highly so. From this I am led to suspect they inhabit the maxillary sinuses, and crawl, on the death of the animal, into these situations in the horns and frontal sinuses.

The breeds of these, like the *Æ. Bovis*, do not appear confined to any particular season, for quite young and full-grown larvæ may be found in the sinuses at the same time.

When full-grown they fall through the nostrils, and change to the pupa state, lying on the earth, or adhering by the side to a blade of grass. See fig. 18.

The fly bursts the shell of the pupa in about two months. See fig. 19, 20, and the veins of the wing, fig. 21.

On their Effects. The sheep are particularly subject to vertiginous diseases, which the agitations and irritations these animals occasion may tend to prevent. In the sheep it will be much more difficult than in horses to prevent or destroy them, particularly if they are seated in the maxillary sinuses: in this

case trepanning would be insufficient, as they would probably be concealed in the convolutions of the turbinated bones.

Perhaps the removal of the sheep to a distant pasture during the months of June and July, while the greatest part of the Bots are yet on the ground in the chrysalis state, and not bringing them on the pasture again till the setting in of the winter, would be the means of destroying them most effectually; and if repeated for two or three years in succession where they are particularly troublesome, the farmers might eventually find their account in it.

The male flies are found not unfrequently sticking to pales and walls about sheep pastures.

Some large flies living in the backs of animals have of late years been found in America, and have been referred to this family; I am, however, of opinion after more mature examination, that they are not truly Oestri, but should constitute a distinct genus; their bodies are for the most part without hair and smooth, and their antennæ plumated, in which they make an approach to the plumated division of the genus *Musca*, as the *Musca, Cæsar, Cadaverina, Vomitoria, Mortuorum, &c.*

For those I have seen I have been indebted to my much-esteemed friend, John Francillon, whose liberality and splendid collection of insects need not my poor encomiums; he received them from the American states of Georgia: and we are indebted for what we know of their habits to his ingenious correspondent, the indefatigable John Abbots, of the Savannah, who communicated drawings and the insects themselves to my friend.

I propose to give an outline figure of three species of this genus, from his cabinet, with the larva and chrysalis of one of them; and one new one from my own, which was purchased from Drury's Cabinet, being all the species I have hitherto seen.

The above indefatigable labourer in natural history in one of his communications states, that in Georgia these flies are termed the Rabbit Flies, as they infest the hares and rabbits of that country. "A rabbit being caught," he says, "I observed creeping out of the skin a worm, (see fig. 24,) which being full fed, went into the ground, the 2nd of August. It feeds between the skin and the flesh, seldom more than two at one time; it changed into chrysalis (see fig. 25,) and the fly appeared the 13th of the September following, by pushing out a kind of door, (see fig. 26.) The skin of the chrysalis was thick, and hard as wood. The fly when it came out had a kind of bladder to its mouth, &c." As the face of most flies on their issuing from the chrysalis is so inflated, there is nothing singular in this; that all which appears to be interesting in this communication is contained in the above extract.

I described one of these singular flies, the *Cuniculi*, in my paper sent formerly to the Linnæan Society, and ventured to suggest, whether it might not be possible that these immense flies have formerly belonged to some of those large animals whose existence is no longer known, but whose bones are from time to time discovered in the earth in various parts of the globe, and that on their destruction they resorted to these small animals as a substitute of necessity.

We may remark in concluding this brief account of them, that if these insects should ever be brought to the aids of veterinary, or other medicine, their effects would be much more powerful than those of the Oestri, from their magnitude and roughness. For distinction I have conferred on them the generic name of *Cuterebra*.

OESTRUS. *Antennæ*, articulis tribus, ultimo subgloboso setâ anticæ instructo, in foveis duabus frontis demersæ. *Os*, apertura simplex, neque ullo modo exsertum. *Palpi*, duo biarticulati, apice orbiculares in depressione utrinque oris siti. *Alarum* membrana laxa et subrugosa.

* *Famil.* GASTRICOLÆ.—CHYLIVORÆ.

Larvæ in Ventriculo Equi enutriuntur, stomachi interiori adhærent corniculis duobus falciformibus acutis utrinque oris sitis. Alarum tracheæ seu Trachypteræ usque ad marginem extremam alæ protenduntur. Corpus parcius pilis obtectum. Tab. I. fig. 16, 23.

1. *Equi.* Oestrus. Alis albidis, fasciâ mediâ punctisque duobus nigris extimis. Tab. I. fig. 13, 14.

Bovis Oe. Alis maculatis thorace flavo fasciâ fusca abdomine flavo apice nigro. Linn. Syst. Nat. p. 969. 1. Faun. Suec. 1730.

Raii Hist. Ins. p. 271. Musca bipennis Oestrum dictus.

Oe. Bovis Fabricii Sp. Ins. p. 398.

Oe. Hæmorrhoidalis, Gmelin Syst. Nat. p. 2810.

De Geer Hist. Ins. p. 291, pl. 15, fig. 16.

Geoffroy Hist. Ins. II. p. 456, n. 3.

Olivier Encyclopedie Methodique. Vide Estre.

Habitat in Pratis inter jumenta; deponit ova in Genubus, lateribus, jubâque Equorum.

Descrip. Apis mellificæ magnitudinis. *Caput* latum, obtusum. *Frons* alba membranâ nudiâ, verticeque piloso, ferrugineo. *Oculi* nigricantes in fœminis minores et distantiores. *Antennæ* globosæ, compressæ c. setâ anticæ correctâ. *Thorax* griseus inter alas obscurior. *Scutellum* fasciculis 2. pilosis. *Abdomen* luteo-ferrugineum, maculis punctisque (in maribus præcipuè) incisurarum nigris. *Alæ* albidæ neque diaphanæ quodam aureo colore relucens cum fascia pone medium flexuosâ et in extremâ alæ maculis duabus rotundatis nigris. Punctum minimum atrum exstat in costâ versâ basin alæ. *Pedes* palidiores, lutei, *Tarsi* simplices, *Unguiculis* atris incurvatis posticis divergentibus squamulisque duabus paleaceis clavatis.

Mas. Abdomen obtusum pube incurvâ et forcipibus duobus atris transversis quæ vaginam muliebrem corripunt et peni adducunt.

Fœmina. cum caudâ elongatâ atrâ, ultimum segmentum vaginale,

subcylindricum et supernè fissum quo modo comprimit, extruditque ovum.

Ovum, album elongatum apice in obliquum sectum, cum valvulâ larvam emittere.

Larva, cute densa tecta, ovata, teres, posticè truncata, antice capite attenuato ore longitudinali corneo labiis duobus et unguiculis duobus atris utrinque oris recurvatis quibus stomacho interno impendet. Ad marginem segmentorum spinis rigidis deorsum spectantibus duplice alterna serie obsita. Per menses duodecim nutrita et ad maturitatem perducta, a stomacho solvitur, per intestinos fertur tandem ano emissâ, in humum decedit.

Pupa, ovalis, obscure rubra c. spinis brevibus rigidis uti in Larvis.

♀. *Varietas* cum alarum apice maculâ unicâ tantum oblongâ et abdomine densè tecto pilis ferrugineis. Specimen vidi in museo Linnæano quod certè varietas β. Fn. Suec. No. 1730.

Oe. Vituli! Fabricii Syst. Ent. VI. p. 231.

2. *Hæmorrhoidalis*. Oe. Alis immaculatis fusciscentibus: abdomine atro, basi albo apiceque fulvo. Tab. I. fig. 21, 22.

Oe. hæmorrhoidalis. Alis immaculatis thorace nigro: scutello pallido, abdomine nigro basi albo apiceque fulvo. Linn. Syst. Nat. II. 970. Fn. Suec. 1733.

Oe. *Equi*. β Fabr. Syst. Ent. Tom. 6. p. 232.

Oe. *Bovis*. Gmelin Syst. Nat. p. 2809.

Reaumur Hist. Inst. Tab. 35, f. 3. Larva T. 34, fig. 14.

Geoffroy Hist. Ins. 2, p. 455, n. 1.

Habitat in pascuis, deponit ova in labiis Equorum.

Descr. Oe. Equo dimidio minor. *Frons* alba tomentosa membranacea. *Oculi* fusci in fæminis lineâ nigrâ longitudinali. *Thorax* pilis flavo fuscis spatio inter alas atro, nudiusculo. *Scutellum* fuscum pilis albis porrectis obsitum. Abdomen atrum medio lucidum basi albis apiceque pilis fulvis. *Subtus* pilosus cinereus, pedibus pallidis longiusculis. *Alæ* aureo-fuscæ immaculatæ, membranâ vix rugulosâ. *Halteres* albidæ.

Femine abdomen posticè elongatum, incurvatum, atrum; *maris* cum prehensoribus masculinis sub ventre instructum.

Larva alba spinigera simillima priori at minor.

Puppa ovata brunnea spinis brevibus incisurarum.

Ovum, atrum, petiolo elongatum.

3. *Velerinus*. Oe. ferrugineus, alis immaculatis lateribus thoracis, abdomineque basi pilis albis. Tab. I. fig. 26, 27.

Oe. *nasalis*. Alis immaculatis, thorace ferrugineo abdomine nigro pilis flavis. Lin. Syst. Nat. 969, 3. Fn. Suec. 1732. Reaumur Hist. Ins. tom. IV. p. 551. Pl. 35, fig. 3, 4, 5.

Habitat in Pascuis.

Descr. Oe. Equo minor, oblongior. *Caput, thorax, et abdomen* pilis ferrugineis tecta. *Alarum* ortus abdominisque basis pilis albis obsitæ. *Abdominis* segmento secundo magis gibbo quam in reliquis tuberculis duobus hirtis. Subtus ferrugineo fuscus. Pedes fusco ferruginei.

β Variat præcipue fœminis abdomine pene atro.

Larva elongata rubicunda glabra spinis minutis nisi ultimis duobus segmentis: in stomacho equi. Tab. I. fig. 24.

** CUTICOLÆ.——PURIVORÆ.

Larvæ sub cute animalium enutriuntur. Alæ um tracheæ seu Trachypteræ citra marginem terminant per nastomosin. Tab. 2, f. 10. *Squamæ halterum grandiores. Corpus valde pilosum.*

4. *Bovis*. Oes. alis immaculatis fuscis: thorace lineis quatuor interruptis glabris atris: abdominis apice pilis fulvo-flavis. Tab. 2. f. 8, 9.

Vallisneri Opere, tom. I. tav. 28. f. 10.

Reaumur. Hist. Ins. tom. IV. p. 503, tab. 38, f. 7, 8.

De Geer Hist. Ins. tom. VI. p. 297, pl. 15. f. 22.

Schaeffer, Ins. Ratisbon, tab. 89, fig. 7.

Fishcher, Dissert. inaug. tab. 3. f. 5.

Med. Com. Vol. I. Larvæ in Sinu frontis mulieris.

Anglis, Breeze, Brize, or Gad-fly.

Habitat in pascuis inter armenta in quorum dorso deponit ova.

Descr. Oe. Equo vix major fronte albâ, undique tomentosâ. *Thorax* anticè flavescens, in medio ater, lineis denudatis longitudinibus quatuor, posticè cinerea. *Abdomen* basi cinereum fasciâ seu cingulo in medio atro, apiceque pilis fulvoflavis. *Squamæ Halterum* magnæ nivæ convexæ. *Pedes* nigri, tarsi pallidis.

Fœminæ abdomen, stylo attentuato atro, compressione evolvendo.

Mas. tab. 1, fig. 30, minor, abdomine obtusiore pube inflexo forcipibus masculinis. Oe. *Ericetorum*. Trans. Soc. Nat. Hist. In

Ericetis prima vere deprehensus a Dit. D. Leach prope Plymouth, Devoniae, etiam prope Londinium. Anne distincta species? — *maifrensis* C.

5. *Tarandi*. Oe. alis immaculatis: thoraceque postice lineis brevibus glabris quatuor atris: abdomine fulvo. Tab. fig. 13, 14.

Habitat in Septentrionalibus. Larva in dorso Cerv. Tarandi.

Tarandi Oes. Alis immaculatis: thorace flavo fascia nigra: abdomini fulvo apice flavo. Lin. Syst. Nat. p. 969.

Flor. Lappon. 360, n. 517. Act. Upsal 1736, p. 31, n. 23. Act. Stockh. 1739, p. 121, tom. III. f. 5, 6. Lappis *Curbma* dicta.

Descr. Oe. Bovi similis at villosior. *Frons* flava pilosa vertice antennisque atris. *Thorax* major flavus latè in medio ater stigmatibus seu lineis elevatis, atris, 4, postice acutioribus. *Alae* subdiaphanae squama halterum maxima margine inflexa squamulaque insuper basin minori corrugata. *Abdomen* attenuatum saturatè fulvum hirsutum, basi thoraceque posterius albidis. *Pedes* atri tibiis inferius pallidis. *Tarsi* rufi c. unguiculis longioribus, tenuibus divaricatis.

*** CAVICOLÆ. ——— LYMPHIVORÆ.

*Larvæ in Cavitatibus Frontis Ovis Alarum Tracheæ, seu Trachyp-
teræ ad marginem alæ tenuiorem haud pertingant nisi unicam,
basis alæ c. lobo reniformi vesicaque parva crenulata. Corpus
ævet uberculis setigeris.*

6. *Ovis*. Oes. Alis pellucidis basi punctatis: abdomini albo nigroque tessellato versicolore.

Habitat inter pecora deponit ova in margine narium.

Ovis OE. Alis subpunctatis abdomine albo nigroque versicolore. Lin. Syst. Nat. p. 970. 5.

Fallisnere Opere, tom. I. t. 27.

Reaumur Hist. Ins. t. 35, f. 22. Larva 8, 9.

Geoffroy Hist. Ins. II. p. 456, n. 2.

Descr. Oe. Equo minor, pilis scatentibus paucis, vertice capitis punctis excavatis. *Thorax* cinereus, punctis elevatis atris, setigeris, lineisque quatuor nigris. *Abdomen* colore albido-cinereum nigro maculatum fugaci. Supra aperturam oris processu parvo conico.

Larva alba ovata, anticè acuminata unguiculis duobus, posticè truncata margine prominenti et squamulis duabus atris respiratoriis.

Supernè convexa lineis punctisque nigris. *Subtus* plana in medio segmentorum punctis asperis atris minutis notata. Pectus subtus appendiculis 4 palpiformibus anterioribus longioribus.

Habitat intra cavos frontis ovium, evaditque per nares.

7. *Cervi*.

Oe. ~~*Dier boi*~~ Reaumur. Ins. Tom. V. p. 67. Pl. IX. fig. 2, 6. *Appendix 73* *Bequa Bonae c. Chrysalide*

Habitat Larva in Cavitate Pharyngis Cervorum.

Valde convenit cum Larvâ Oestri Ovini at major.

8. *Stimulator*. Oe. flavescens pilosus alarum basi thoraceque in medio atris.

Tab. I. fig. 28. Alarum tracheæ f. 29.

Oe. *Pecorum*. Fab. Syst. Ent. *trompe*? Ejusd.

Oe. *Microcephalus*. Dissert. preced. nostri.

Habitat in septentrionalibus.

Descr. Muscæ bombylantis magnitudinis et staturæ. Frons uti in muscis provenit, in medio os absque probosceide barbâ albâ, vertice pilis flavescens. *Oculi* fuscii nigro nebulosi cinctoque. *Antennæ* globo atro setâ porrectâ. *Thorax* hirsutus, flavescens ad incisuram mediam, exinde ater, etiam alæ insertio atra subnuda posticè et scutello subnudo circumcincto pilis cinerascens. *Squama Halterum* perlucidum decoloratum neque magnum. *Alæ* venis nigris abbreviatis conspicuis posticè denticulatis.—*Abdomen* breve subglobosum pilis parciùs tectum rufo-cinereis utrinque basi et posticè pilis subfulvis; *subtus* pilis cinereis hirtum in medio atrum denudatum. *Pedes* omnino c. tarsis atris.

9. *Phobifer*. Oe. ater, alis plaga nigricante: thorace abdomineque posticè rufis.

Tab. 2. f. 30.

Habitat in Georgiâ Americanâ I. Abbott. In museo amiciss. I. Francillon.

Descr. Magnitudo muscæ tenacis at gibbior uti in Oe. hæmorrhoidali et forsân ejusdem familiæ. *Oculi* fuscii. *Thorax* rufus utrinque pilosus uti scutellum. *Alæ* a basi ad medium lineolata seu plaga nigricante ad costam, aliter diaphanæ parum puculatæ. *Squama halterum* major diaphana. *Abdomen* atrum pilis fulvis seu rufis tectum precipue ad extremitatem.

CUTEREBRA. Os, haustello corneo brevi in Fissura capitis recondito.

Antennæ triarticulatæ, ultima articulatio ovata, setâ instructa plumosâ. *Palpi* nulli.*

1. *Cuniculi*. Cu. nigra, thorace piloso lutescente in medio latè antice nigro.
Habitat in Cuniculi et leporis dorso Americes. Tab. II. fig. 26.
Descr. Magnitudo, apîs terrestres nostræ. *Caput* nigrum oculis fuscis fronte porrectâ. *Thorax* flavus hirtus antice ad medium macula magna atra rotundata. *Scutellum* flavum. *Abdomen* nigrum basi et lateribus segmentorum flavis. *Alæ* fuscæ, lobo baseos obscuriore. *Subtus* nigrum flavo variegatum. *Pedes* nigri, tarsis latoribus. *Larva* fusca undique muricata aculeis minutissimis; fig. 24. *Pupa* fusca exasperata posticè aperturis duabus luteis respiratoriis. Tab. II. fig. 25.
2. *Horripilum*. C. nigra, thorace, abdominisque primo segmento pilosis flavis.
Habitat in Georgiâ apud Savannah Americes. J. Abbott. Tab. II. fig. 27.
Descr. Magnitudo et statura omnino præcedentis at thorace absque macula ista magna nigra quæ ex aliquo casu denudasse suspicor.
3. *Cauterium*. C. atra lævis, thoracis lateribus luteis, punctis tribus atris.
Habitat in Americæ sylvis prope flumen Ogeechense. J. Abbott. Tab. II. fig. 28.
Descr. Minor C horripilo, *Caput* atrum thorace latius. *Oculi* grisei, albo punctulati, orbitum anterius striis 4 niveis, inferius utrinque oris luteum. *Thorax* ater lævis convexus ad latera flavo vellere tectus punctis tribus et orificio respiratorio atris. *Abdomen* nigro-cyaneum infra atrum, punctis pallidis irroratum et ultimum segmentum-utrinque. *Alæ* nigricantes quam in cæteris obscuriores. *Pedes* atrî lucidi.
4. *Purivora*. C. cœruleo alba, Thorace capiteque punctis atris.
Oestrus buccatus. Fab.
Habitat in Americâ. J. Abbott. Tab. II. fig. 29.
Descr. C. cauterio major, valde gibbus. *Caput* magnum thorace latius, insuper atrum lucidum punctulatum maculis duabus in vertice, et quatuor ante oculos majoribus, albis. *Frons* parte inferiori cœruleo-alba seu argenteo-cœrulea, punctis lucidis octo atris, medium par inferiorum quasi palpos æmulantes, cum petiolo

* Corpus hujus generis mûscarum lævius et cataphracta duriori obtectum præcipue abdomine. Alæ in omnibus mihi visæ coloratæ, lobo baseos dissecto rotundato, et a posteriori thoracis parte prodeuntes.

scissuræ connexo. *Thorax* cæruleo-incanus anticè lineis obscuris nigris ad latera villosior maculis tribus atris. Scutellum lineatum supereminet abdomen. *Abdomen* atro-cæruleum lateribus posticeque cærulescentibus nigro irroratum. *Pedes* nigri femoribus rubris. *Alæ* fuscæ lobo baseos dissecto nigricante.

OESTRUS. *Antennæ* with three articulations the last globose with a bristle in front deeply sunk in the head. *Mouth* a simple aperture without a trunk. *Palpi* two, of two articulations, last rounded, situated in a depression on each side the mouth. *Membrane* of the wings lax and puckered.

* STOMACH BOTS.

1. *Equi.* *Oe. The Knee Bot, or great spotted Horse Bot.* Wings opaque white, with a golden tinge, a transverse black wave and two spots near the extremity: a minute black raised dot near the base of the wing. Abdomen reddish brown, with black spots and points. Legs red. *Female* with lengthened abdomen, curving underneath: *male* obtuse.

In meadows, laying its eggs or nits on the knees, mane, and sides of horses.

Egg white, oblong, pointed, the other extremity obtusely truncated with a lid. *Larva* or *Grub* barrel-shaped, at one end tapering, obtuse at the other, covered with a thick skin, beset with a double row of prickles round each joint, alternately placed.

In the stomach of the horse, to which it adheres by two short black hooks, one each side the mouth.

The *Pupa* or *Chrysalis* oval, dark red, rough with prickly points, under dung.

2. *Hæmorrhoidalis.* *Oe. The Lip or Fundament Bot.* Wings without spot, brown. Face white, antennæ in a black pit or depression. Body thinly covered with hair, greyish in the middle of the thorax and abdomen black shining, base of the latter white, and extremity red orange. Beneath grey, hairy. Legs pale red.

In meadows, laying its eggs on the lips of the horse.

Egg black, oblong with a petiolus or foot stalk.

Larva white, with spines or prickles like the former, but less and rounder.

In the stomach of the horse. *Puppa* red brown with small prickles round the segments.

3. *Velerinus*. *Oe. The Red, or Breast Bot**. Wings clear, unspotted. Body oblong, tapering, covered with reddish yellow hairs; sides of the thorax and base of the abdomen with white tufted hairs. In meadows. *Larva* oblong, coral red, smooth joints, rounded, two last dark red. In horses stomachs.

** SKIN BOTS.

4. *Bovis*. *Oe. OX BOT or GAD FLY*. Wings brownish unspotted. Thorax with four smooth raised lines. Abdomen, base white, middle black, end orange red. Legs black, with red feet. In meadows. *Larva* or grub in the backs of cows. White, with eleven segments or divisions, with a narrow and a broad line of rough points on each.

Leach told me that
it was only
one of the former.

β *Vernalis*, SMALL OX BOT. Less than the former; colours more obscure. ~~I possess both male and female~~, whether a distinct species or a variety produced by season, I am unable to determine. It also is found in America. *✓ Pl. & fig. 31*

5. *Tarandi*. *Oe. RHEIN-DEER BOT*. Wings immaculate. Thorax with four raised short lines. Abdomen with orange hairs. Like the former, but larger, more hairy, and of a darker orange. In Lapland, laying its eggs on the back of the rhein-deer. *Larva* white, black at the extremity.

*** FACE BOTS.

6. *Ovis*. *Oe. SHEEP BOT*. Wings transparent, minutely spotted near the base. Abdomen reflecting white and black according to the light, in squares. Thorax with raised black dots. Among sheep, laying the egg on the margin of the nose. *Larva* white, with black transverse lines and spots in the frontal cavities of the sheep

* In the cabinet of my esteemed friend, J. Francillon, there are specimens, sent by J. Abbott from America, which I take to be of this species, though somewhat smaller, and the colours much more obscure. He observes, that the parent fly lays its eggs on the breast of the horse.

FINIS.



(E. Cerni. c.)

For a full description of this fly, *Æ. Cerni*, we refer the reader to page 92 of our Monograph, 2nd Supplement.

The following communication was sent by me to the "Zoologist" of my friend Edward Newman, No. 1, for January, for the year 1847.

Note on the Bot infesting the Stag.—After considerable delay, from various unforeseen causes, I am enabled to present thy subscribers with a view of the larva and pupa of the bot of the deer, objects hitherto quite unknown, I believe, to naturalists. Reaumur has indeed given a representation of the larva of this species, but it is evident, from the very elongated figure he has given of it, that it must have been dead some time, and obtained this lengthened figure from putrefaction. This larva, several of which I have had alive, so much resembles that of the *Æstrus* of the sheep, that they might be taken on a careless inspection for one another, that of the deer is, however, somewhat proportionally longer and less angular. All efforts to preserve them out of their locality in the throat of the stag seem hopeless; I have had many from the New Forest by the kindness of the Superintendent there, and though kept on membranes and fed with milk in a warm place, they uniformly died within forty-eight hours. The present specimen was so far advanced in its growth that it assumed the chrysalis state, but died in that state and never came out. Though positive proof still fail us, I am brought to the firmest conviction that the stag bot is no other than the *Æstrus pictus*, found by my late friend George Samouelle, in the New Forest, and since taken in the same place by our very worthy friend and excellent entomologist, J. C. Dale, Esq.; and as there is no bot-fly known in this country that we do not fully understand in all its states, so it brings us to the all but absolute proof that it is no other than the *Æstrus pictus*, so called by Curtis in his excellent "British Entomology," and by the continental naturalists. This larva, with others, at different times was received by me by the kind aid of my worthy friend John Bolt, of Lyndhurst, assisted by the kindly interference also of the present forest-keeper and ranger, who desired any larvæ found in the killed venison to be brought to him. Any one desirous of seeing a good representation or figure of this species may consult my "Treatise" on this genus, pl. 1, fig. 40, with nearly or quite all the other members in their respective changes of this truly remarkable family.

Detruidator.—*Cuterebra*, nigra, holosericea, abdomine glabro cærulescenti nigro, lateribus albo bicingulatis, posticè rufis.

Habitat calidioribus Americis. Ex Museo Dom. Westwood. Vid. fig. 4.

Descr. Cædit maximis hujus generis. Caput obtusum, vertice atro, inter oculos rufum, ore et inferne latè album hirsutum. Thorax ater holosericeus, infra insertiones alarum et subtus, albus. Halteres concava concolores, erectæ. Alæ longiores aurulento-fuliginosæ. Abdomen latè cæruleum ad latera cingulis duobus latis albis, apiceque hirsuto flavescenti rufis. Pedes omnino atris tarsis prælongis articulis sagittato-acutis.

Atror.—*Cut.* atra, glabra, abdomine cærulescenti-atro marginibus segmentorum albis.

Habitate creditur in Africâ, v. fig. 5. Ex Museo D. Westwood.

Descr. Facile inter maximas hujus generis omninò atro cærulescens, lucidus. Thorax anticè scabriusculus, posticè glaber. Halteres scutellum circumcingentes, erectæ, maximæ. Alæ parum puculate, obscurè aurulento, fuliginosæ. Abdomen latum, obtusum, incurvatum, atro cæruleum incisurarum marginibus, albis. Ad latera et subtus albo latè conspersum. Pedes atris geniculis tibiærum extus albicantibus.

**ON THE VICES OF
HORSES.**

BY B. C.

LONDON. 1839.

THE following Essays on Vice in horses, are thrown together as an endeavour, at a rough foundation, for a more consistent consideration of this necessary department of horse knowledge. . . . *Regent's Park, 6th mo. 1839.*

THE name in common use for this disorder is no doubt very ancient and of purely English origin, which is not very usual with horse complaints in general, which are derived for the most part from the Norman-French, or base Latin.

The term used indeed at this period would appear not strictly true, as the horse usually has no crib to bite at in this day in the stable, the manger occupying its place for his operations. It would seem indeed, that the use of oats for horses was much more rare formerly than at present, and that they were usually, in common with the other cattle, fed from the crib provided for their general provender. On oats becoming more used, the necessity for a more solid receptacle for them became urgent, and the wooden trough thus afforded them was called *the manger*, no doubt from the French, *manger*, to eat, and the crib, which was a sort of rude square basket, formed of wide spars of wood, and often still to be seen in farm yards for the cattle, was now changed in its form, and hoisted high up over the heads of the animals, and fixed to the wall of the stable, obtaining the name of *rack*; but as a rack so elevated cannot be conveniently got at, he expends his uneasiness upon the wooden manger, although the old name of crib is still retained. The term Rack would also appear to have been of French extraction, from their verb, *racler*, to rattle, in allusion perhaps to the noise the staves would make if struck upon in rapid succession with a stick.

The crib-biting horse has generally a lean constricted appearance, the skin being drawn tight about the ribs, the hair staring, and thready, and devoid of gloss, a sunken watery eye, or else too dry, the muscles of the face also, as well as the skin, drawn up with rigidity, and when unemployed in eating, his almost constant amusement is, to grasp with extended mouth the rail of the manger with his front teeth, then to draw himself up to it, as to a fixed point, by a general contraction of all the muscles of the head, neck, and trunk, at the same time this effort is attended with a grunting sound, apparently from air expelled by the mouth; a relaxation succeeds, and then a new effort, slaving the manger very much with the tongue, for as the mouth is held wide open, and the jaws distended, the saliva naturally takes this direction.

The horse that has contracted this unsightly habit grows lean, his digestion after a time becomes impaired, and it is generally conceived that he draws air into his stomach, which is the cause of this; his temper becomes soured, and more or less weakness and unfitness for service, ensue, according to his natural strength, for some do not appear materially in this respect to be injured by it, while others are obviously rendered much weaker by it, and more incapable of a proper day's work; it appears indeed that horses of a fiery, hot, and unkind temper get the most easily into this vice.

How this extraordinary propensity becomes first created, has not been, we believe, much attended to; and with some it appears to arise naturally, as though the sucking of air gave them pleasure, or a relief from some sort of suffering; and at first we imagined that pains of the stomach from acidity, or other causes might create it, as we see horses eat dirt, or gnaw the walls, to alleviate unpleasant feelings of this organ. But bad digestion and foul feeding are probably more

often a consequence than a cause of this malady. And we observed that horses at all disposed to it may be easily led into it by the practices of the grooms in cleaning them, of which we can have no doubt; for if they clean them before the manger, and irritate them with too severe a comb, and in parts where they cannot endure it, they seize upon the manger for a counter-action to their sufferings, and in doing this they first get a habit of it, and which may afterwards extend to the removing of other pains or distressful feelings. By this means, and especially if the grooms, and some have a happy knack of this, after every bite, put in a blow or stroke of the comb, when following each other in regular succession, they thus create a vice which may or may not continue afterwards, according to the situation or circumstances attending the individual. Some are said also to get it by imitation of other horses; whether or not the same practices of the groom applied to several horses in the same stable, should not be rather apprehended to be the true cause, we are not assured; but in one instance, we think, we observed this satisfactorily enough to be the cause, though it passed for imitation.

To prevent the habit, it appears but reasonable with regard to such horses as are inclined to it, always to turn them from the manger before they are cleaned, with their heads to the heel-posts, or indeed to clean them in the open air, and above all, to avoid as much as possible irritating those that have preternaturally thin and irritable skins, by too rough an iron comb, and also to break through any regular habit already induced of biting after each stroke of the comb, for they learn to do this at first only in the most sensible parts, as with the flanks, the inside of the thighs, the belly, &c. but afterwards in every part on the slightest touch of the comb, or even at the sight of it. Some horses, it must be admitted, are truly difficult to clean; and many also are rendered more so than they need be, by inconsiderate rashness, and ill applied severity. To prevent these associated actions and mischief, proper precautions cannot be taken too early, for a habit of this kind once formed, is not easily afterwards to be subdued, even by great patience and by well-judged measures.

To cure or break horses of this vice is difficult; cutting off the end of the tongue has been resorted to by some as a cure for it; the soreness created by this means destroying the inclination to the trick for a time, when the habit once being interrupted, might or might not again return.

Another and more usual way with these horses is to buckle a strap tight about the neck, so tight as to prevent, by the constriction of the throat, the power of doing it, or at any rate, to create sufficient uneasiness to disincline them to it. Great care should be taken however, in doing it, not to damage the trachea or larynx.

In concluding these remarks we may observe, that in the purchase and sale of horses this vice is not unfrequently a subject of litigation: should we venture to interpose an opinion on the question usually agitated on those occasions, whether a horse be unsound or not, or, in other words, returnable or not, with this defect, we should say, if the warranty extended to soundness only, the horse is not returnable, as horses are often sound with it as to their going; but if vice is stated in the warranty, the horse is unquestionably returnable, as it may be ranked amongst the worst of them.

The jurisprudence of horse-buying and selling, or security from deception, has never yet attained

to anything like consistency in this, or any other country probably, and very contradictory decisions are often arrived at in these cases. A settling of this ticklish question is more than I can at present hope to accomplish; however, the following is what at the present moment appears to me equitable, and we leave it for future examination. A horse that is being curried with that abomination and scourge of the race, the sharp iron curry-comb, made without rule, and used without discretion, if a horse having this weapon aimed at his loins, or his flank, or inside of his thighs, expresses his aversion by seizing the manger, the wall, or the rope he is tied up with, between his teeth, such is not necessarily to be esteemed a crib-biter, as very many horses will do this, and without ever becoming crib-biters. But if such horse, on going into the stable, shall practice this habit when no comb is touching him, or is in sight even, then such horse shall be deemed *returnable*, or is a deficient horse, having a vice which the warranty should not fail to include in it, and especially so if he throws his mouth very wide open, and sucks his wind, as he is then not only with a *vice*, but also in a fair way, by weakening his stomach, to become diseased, from a bad digestion of his food, and all its natural consequences.

The Arabians, whose horses have the finest and most glossy coats of any in the world, use only a little camel's or horse's dung grasped in the hand, or of straw, to clean them with, and all nearly may be done that is really necessary by a judicious use of it, or by hay-bands still more soft, and, we are assured, it would be much better often to let it go undone, rather than to irritate the animal to such a degree, as to excite his violence, or create a miserable vice of this sort; for dirt even will fall off of itself if left, without much injury or inconvenience to the animal; that to be too tenacious about it in all cases is little less than a folly.

Where however, the vice of crib-biting has taken place and has become a confirmed habit, there is no better way of breaking them of it, that we at present know of, than Yare's muzzle, formed of light thin plates of iron crossing each other at right angles nearly, and at the bottom of it, or next the lips, with two thin iron bars, parallel and nearly flat, and a little projecting. Now these will admit the lips through to take up hay or corn, but will not allow the teeth to come in contact with the manger. Having experienced the great utility of this apparatus, I assisted in procuring for him the silver medal of the Society of Arts about ten years since, in whose volumes a more particular account of it may be seen.

In Yare's apparatus, the above muzzle is sustained about the mouth of the animal, by the usual stable headstall; we should propose however, a great improvement in its effects and office, by carrying the transverse, or occipital strap, to some distance from the base of the ears, and so not irritating them, and also, and which is worse, from the pithing place of the neck also, or the open space of the *Atlantal hiatus*, the tenderest and most fatal part of the whole horse, laying it rather upon the chine of the neck, or *Encolure*, as the French would call it, instead. A system first observed upon by us, and more fully explained, in the essay, *On the Bits of Horses*, and which we there showed was also well understood in the more enlightened periods of the Greek and Roman empires.

VICES OF HORSES. ON SWERVING.

It so happened that the early part of my life passed away without my encountering any cases of this sort, and the later part of it has been altogether as much annoyed by the frequency of its occurrence. That I should have been ready to have smiled at the mention of it then, as now I hear of it with feelings of as much aversion, almost bordering on apprehension. Such very different views of things does a little actual practice make with us.

A case will perhaps best explain the nature of this vice. Going one day in my chair, or gig, into Friday Street, Cheapside, on business, I drew up to the side of the kirk to converse with the gentleman who sent for me, a hackney coach at the distance of forty yards had drawn up on the same side at the kirk also, and was waiting there upon his fare. After some time thus spent in conversation with the gentleman who had sent for me, I quitted him and crossed over to the other side of the street, in order to pass clear of the hackney coach, and so return into Cheapside; but what was my surprise, knowing myself to be clear of all obstacles, and thinking perhaps of other things at the time, to find myself immediately almost drawn into collision with the above hackney coach, my horse at the same time laying down his ears, and seeming gratified at hearing the grating of the two vehicles, mending his pace however a little at the same time, as though conscious of what he might expect, and that he had been about no good; supposing however, it possibly to have been my own fault, from not attending enough to the reins, I gave him a cut or two and we passed on home; after this, collisions became so frequent as to be almost of daily occurrence. But so new was this species of vice to me that I still doubted of my own carelessness in driving (though using all proper attention as I believed), till at last I determined to make experiments with him to ascertain it more satisfactorily. One of these I well remember was made in going out of Hounslow town, towards the heath, my late worthy friend James Kidd of Brentford was with me in the gig, and we were then in the very middle of the road in a trot, and I bid him direct his attention to the mile-stone, about a hundred and fifty yards before us, and fairly, as usual, placed on the right side of the road, just beyond the terminating wall of the town; now, said I, I'll hold these reins perfectly even just where they are, and see if this horse does not go off from his course, so as to bring us in contact with the stone; something also immediately after engaged our attention and conversation, and forgetting the former object for a moment, we were not called to our first object again but when in instant danger of being wrecked on the mile-stone. This, as he must have departed from the middle of the road, where he had been moving before, exhibited so clearly design and malice, or whim, that I gave him an allowance that passed him at a quicker pace in the middle-road over the rest of the heath. But I acknowledge I did not discover that this beating, though it made him more cautious and shy of doing it, was any cure for this strange propensity, since afterwards, on all fair opportunities, he, if not most carefully watched, did not forget to have the gratification of a collision, that a constant unceasing vigilance in the use of the reins became highly necessary. A worthy friend of mine not having a proper share of this vigilance, found himself and his whole family fairly upset into a peasant's potatoe garden, among his potatoe plants, to the astonishment of the natives, as much as my worthy friend himself, who till then had not duly considered this business of swerving.

The above may suffice to afford some notion of the vice itself, and although a constant watchfulness will cause the danger to be less imminent, yet truly wearisome is this alternative, and I am sorry to confess also that, although my experience has not been inconsiderable in contending with this species of vice, it has not afforded much useful advice on which I can satisfactorily rely, or recommend to my reader. I have thought that at its first appearance the not noticing it too much, or falling into severities, or seeming too much to feel or resent it, is best, and not to pursue it with too solicitous a care, which seemed rather to augment the evil than diminish it, and called up attention to it on both sides, carrying on an unceasing fretfulness and apprehension, and the exhibiting ill temper and a continual desire of severely punishing it, ended in nothing that was satisfactory. People generally, after these sort of combats, terminate the contest by selling the object, often at a loss, which is but an indirect admission of being beaten.

A continual using of the reins on every small occasion, or almost without any, is tiresome to horses, and altering their course frequently is tiring and perplexing, and a perpetual apprehension by this minute directing is soon recognised by the horse, and only incites to the disorder. I have therefore endeavoured to do as little as possible with the reins, but to keep the horse vigorously and industriously at his work, and to the very end of it, and where the road was wide, and room plenty, and such I would chuse, if possible, in the use of him, let him have the free use of his liberty without showing any apprehension that he should be sensible of at least, keeping a good look out however, that he carried me into no real danger, treating him in this midway with apparent confidence and liberty, and not hauling continually upon his mouth, as in fearful, timid apprehension, he would in time be so managed as to lose much of his tricks, or entirely perhaps, whilst a too sedulous care and appearance of continual fears and apprehensions, would only increase them, and although using an apparent indifference and carelessness even, if any real obstacle or cause of alarm occurred in the way, creating a real danger, then the reins should be resorted to with force and decision, but only for a moment, for when the object was passed their relaxation would please the animal, and remove that disagreeable impression which a constant care and solicitude is sure to create. Fits of passion, and attempts at severe punishment, seldom answered much purpose, I have thought, and certainly rendered the danger greater under particular, or difficult circumstances. For there is such a thing as using too much guidance, and of being too busy with the reins; an easy, apparent carelessness, is better in the use of horses than this. The main thing is, if possible, to let the vice die away and be forgotten, by not exciting it, and even if the horse challenge to the combat by exhibiting it, not to accept his challenge, and especially in his own way and time. In overacting our parts with the reins, the animal discovers our timidity, and especially if he has aforesaid succeeded with a timid, ill-managing, uninstructed rider, for he then will play upon us, or endeavour so to do, for horses are cunning in this respect. Strong, ill-tempered horses especially, will often challenge and provoke the contest, which if engaged in, in mere brute force on both sides, will generally terminate to the advantage of the beast; it is therefore best avoided, and this by rendering things easy, free, and unembarrassing as possible, the vice not being practised, as we have said, or called up, may die away and be forgotten. Firmness however, when requisite, with no hesitating or doubtful conduct, and that pursued but for a moment, is the way to gain the admitted and acceptable ascendancy, mixing if possible, gentleness and good humour with it.

Perhaps in a thoroughly confirmed case of this vice, the taking the horse off from single harness altogether, would be a prudent step, only working him in double harness with a horse, or horses, having no such propensity, which would perhaps, with the other measures we have proposed, enable him to render his services without much annoyance, and if judiciously used, to forget it altogether, and he might continue such service to the end of his days; or if used in single harness again, he must be used with all the necessary precautions, so as not to create a renewal of it, by a free and not too sedulous driver, and one who perhaps did not loiter much upon the road, to give him time for engendering evil thoughts, which also is another way of preventing, if not curing, many vices.

VICES OF HORSES. REARING UP BEFORE.

THERE may be several causes or ways of this vice being created, one only I shall give here, which as it occurred under my own eye, I can describe with the more truth and certainty; and it would vastly tend to the sure increase of this kind of knowledge, without those heavy drawbacks upon its progress which are made by the removing one half, aye, often more, of mere assumption, before we can come at anything like a permanent foundation to work upon, it being much more easy in writers to invent than to experiment, or cautiously to observe.

I once bought, at a sale at Tattersal's, a beautiful young stallion, a son of *Waxy*, a famous racer, one of the stud belonging to the late Lord Heathfield. I therefore called him Heathfield, and as he was but three years old, I bought him to watch (as he had never been shod) the natural developement of his foot, which I think is represented in my fourth Plate of the Hippodonomia.

With this young horse I used to go my rounds among my patients, and as he was a high spirited little fellow, though perfectly tractable, and broke in by myself, I was surprised after a while to find how touchy he got about being mounted, offering to rear up as soon as ever my hand seized the reins, and my foot entered the stirrup. Being pretty active, and supposing it was a humour that would not last, I passed it over, and got on with him as well as I could, though exceedingly troublesome and disagreeable; at last however, it got to such a pitch, that my toe was no sooner in the stirrup than up he was, and to such a height that it was impossible to take my seat—in short, he became perfectly useless to me, nor did I see what I could do with him to break him of it, as scolding and beating only made him worse.

As I lay in bed one morning early meditating on my young horse, and my miserable situation, I resolved to try an experiment with him to see if I could not cure him of it; I ought however previously to say, that accident put me into possession of the true cause and origin of this wretched vice he had acquired, and which I will briefly relate. It often happened that in order to go my rounds, the little horse was led to the countinghouse-door in the yard, where I usually mounted, but often called upon by strangers on business, and being detained some time perhaps, he was held by the groom till I was disengaged, and could find time to mount him. One

morning, hearing a bustle in the yard, my eye was directed that way, and I saw in an instant the key to the whole mystery. The little fellow growing impatient to be gone, and of standing in one position so long, had dared to toss his head about, as his betters sometimes would have done, to express his indignation and unwillingness of the delay, his mouth perhaps held coerced by the closing of the bits. This movement of the head displeasing the booby groom, he to punish him for his restlessness, gives him a jag in the mouth with the reins; the jerk and impression having strong effect on his lower bars, and he further irritated by this treatment, and not at all subdued into quietness by it, only tossed his head up the more, first however pushing his head down as low as he could get it, and then the bits being applied with a harder tug and more severity, set him upon defending himself by further proceedings, and he found by lifting his head aloft he parried in some degree the stroke, the bits then running back along the bars, lodged against the front grinders, and taking advantage of this discovery and mode of defence, he next lifted up all his fore-parts, and at last carried them aloft into the air, in spite of this pulling of the groom, standing only on his hind legs. Just going out at this moment, and seeing the man in the act of jaggng him, and he with his fore-parts in the air, I saw at once all the affair, and how the thing had gone on, *fin pour fin*, step by step, till he became a rearer. I offered to mount, but the moment he felt the restraint of the reins and my toe in the stirrup, up he was completely on end, and to try to mount was of no manner of use. What to do I did not know, for severity or coaxing had precisely the same effect, that is, none at all; and my horse was to me as perfectly useless as if I had none.

Meditating one morning, shortly after, on my miserable situation, as I have said, I bethought myself of a stratagem that might possibly reclaim him, and as it succeeded perfectly to my great joy, I will briefly relate it, and this without employing any cruelty, or even what might be called severity of any kind.

My experiment began at six in the morning, and did not end before three in the afternoon, by my looking out of my chamber window and calling to my stableman to saddle my young nag, and bring him out before he fed him, and when saddled and bridled, to hitch the rein to a hook in the yard. This being accordingly done, I went down only dressed in my morning-gown, and ordered him to be unhooked, and led to the usual mounting-place opposite my countinghouse-door, where also I soon appeared, and patting him on the neck, offered to mount by handling the reins in my left-hand, and putting my foot in the stirrup; this I no sooner did than my gentleman began to lift his fore-parts in the air, and I patting him on the shoulder, dropt the reins from my hand and my foot from the stirrup, and ordered the groom to lead him back to the hook in the wall, and there leave him. I went up to bed again, rose at eight, and ordered him again to be led to the mounting-place at the countinghouse-door, where I again offered to mount, but he reared and bounced so violently that I ordered him back to his hook at the wall. He could hear the other horses being fed and having their breakfast, which seemed to annoy him much, and made him fly about and become very fidgetty. Having breakfasted about nine o'clock, I had him loosed from his hook and brought to the countinghouse-door, and offered to mount, but he would not let me, so ordered him back to his old place at the end of the yard. About ten o'clock I had occasion to go out for a couple of hours on business, and at my return I caressed him, and at the

same place again offered to mount, but he raved and jumped about, and reared most violently, so I used soothing language to him, and ordered him back to his hook, he however *flew* about considerably, and his eyes shot fire, and he seemed exceedingly exasperated and indignant indeed. At twelve and at one o'clock I tried him again, but he was more impetuous than ever, almost threatening to kick us all. I dined about two o'clock, and shortly after had him led to the upping place, but he resented it, if possible, with more violence than before. I said 'very well, very well my friend, you shall once more go back to the hook,' and at three I again had him brought down, and presented myself in good humour, and patted him, and he seemed more composed; and that the experiment might not be eschewed under these favourable appearances, I lost no time in getting into my seat, patted him, rode him off to a rich brewer's stables in Shoreditch, whose horses I attended, and where I knew he would find plenty of good corn and chaff, and clover-hay, in the mangers of the stable of the dray-horses, to reward him for his compliance; and after a stay of about a quarter of an hour, during which time he did not forget to make good use of the opportunity afforded him, I drew him out of the stable by the reins, and bringing him into the open yard, mounted him with as quick a movement as I could, and then patted and encouraged him; this speed I used to give him no time for reflection on his old trick. He carried me well on my rounds, and I then returned home, where he found his breakfast still in the manger, and from that day he never reared on my mounting. I however took the precaution of never having him brought out till I was at liberty immediately to mount him. Indeed on recurring to my notes made at the time, I find that on the next occasion of mounting on the following morning, in order to destroy and keep out of sight old reminiscences and associations, I would not let the groom touch him, but went into the stable alone and mounted him there, and from this time forth I had no further trouble with him as to his being mounted. More may be done, I am well assured, by well-concerted stratagem in vicious cases, than by beating and violence.

VICES OF HORSES. **RUNNING AWAY.**

As this terrible vice resolves itself at last into a question of education, and of Bits and Reins, we shall refer the reader to our ample treatise on that department, under the head, *Bits*.

VICES OF HORSES. **YERKING OUT BEHIND, OR KICKING.**

Not having anything that we believe to be new, or interesting at least, to communicate on this particular branch of the subject, we merely add it in form to the other vices, which have not, we apprehend, ever before appeared in juxtaposition for view and consideration, and nearly in alphabetic order.

VICES OF HORSES. ANOMALOUS, OR APPREHENDED VICES.

IN treating of the vices of horses we begin with those which, although apprehended as such, are not strictly so, for it is most true that horses often get miserably scourged, and punished for offences, and apprehended vices, which are none of theirs', but are proceeding from causes which they are not in any way to blame for; the gross injustice of such treatment must therefore be the more poignantly felt by them. The following cases may perhaps serve to illustrate this kind of vice as it is called, the only way we at present know of, of rendering plain and intelligible this class of offences.

A riding mare of my own once took to going very carelessly on the road, with her fore legs and feet, so much so, that she seemed as though determined not to sustain herself upon them, and as though perfectly regardless whether she fell down, or not; if whipped, or spurred, she only mended her pace for a few moments, and then relapsed again into her former perilous mode of going. Such feebleness and misery did she exhibit that I began to be apprehensive whether or not she would not have lain down with me in the road, occasioning feelings and apprehensions of the most painful kind, and such as I shall never forget. It being hot weather, it was first attributed very naturally to laziness, and the usual remedy applied for it. Her temper also became so soured that she would take any pace but the one you wanted her to go. Now all this happened to me, and is happening to thousands daily, and the idea of riding, to those much acquainted with these things, becomes almost terrific.

The unpleasantness and apprehension of danger becoming extreme, I determined upon investigating a little into the cause of it, and on removing the cramping irons, (for I can hardly use the delusion of calling them shoes) we discovered that the inflexions or heels as they are called, had been so terribly squeezed by the iron being nailed upon them too strongly, and the iron itself perhaps also bearing partially and hard upon the part, that the blood had been actually forced by rupture from the vessels of the circulating foot into the horn covering it, which was discoloured and red, and then the smiths, in order to reconcile this anomaly, and to mystify the matter, called this miserable smashing and bruising of the foot, a *Corn*—amusingly enough, as though a corn or *cornu*, horn, could possibly invade a part already by nature densely covered with it.

The cause, viz. the iron, having been extensively removed, the effect soon after ceased, and the mare resumed after a while, her usual cheerful mode of going, and an habit apparently vicious, and for which she had severely suffered in a double sense, was done away.

It is unfortunately the fact, that in the nailing on of these irons to horse's feet, it can be done with any degree of force that the hammer can inflict, and what cannot the force of a hammer do? And not only can the force of the hammer draw the blood from the vascular into the horny sole, but also it can give any other degree of pressure short of the absolute bursting and extravasation of the blood, but quite enough to be extremely annoying and painful to the animal, yet deniable, since there are no appearances of blood to confirm the evidence of such pressure existing. Also the lateral compression of the nails is always acting with more or less force, in incommoding the foot, enough we see in a very short space of time to change the form, and disorganise the entire structure of it. The proofs and details of which fact will be more fully understood by consulting the *Podophthora*, where also the supposed vice of the *Tumble-down Horse* is fully laid open.

Other causes too of suffering and creating apprehended vices, may be often found in their furniture of various kinds, as bits of most unaccountable makes and shapes; of collars, bearing unequally; of traces, of unequal length and badly adjusted; and especially annoying is but too often, the head-gear; all of which, though tormenting and irritating to the animal, and creating resentment in the rider also, yet would pass unnoticed as being the cause of offence, by a very large share indeed, of riders and drivers.

The following also is a sort of vice of somewhat anomalous character, and that it behoves us to guard against, which may be noticed in the following case. A horse is tied up with an old, and it may possibly be, a somewhat decayed, halter; in moving about in the stall, or leaning back, he accidentally breaks it, and gaining his liberty, ranges the stable at his pleasure, and gets what he can from every manger. Encouraged by this piece of unexpected success, it is ten to one if he does not try the amount of strength of the next halter that he is fastened up with, and if he perchance again succeeds in breaking it, there is great reason to fear it will become with him a confirmed vice, and some day whilst at liberty, in getting kicked by other horses, may greatly endanger his life. That it behoves us to use great care in looking well after our apparatus, and if possible to prevent a horse from knowing his own powers. The same may also be observed of slipping the halter off the head. Again, another case may serve to illustrate a different species of vicious susceptibility, an improvement also upon the above chapter of casual accidents.

My young horse in going over the London stones, as they are called, driven probably by some cart, or coach, near to the declivity of a kennel, made a long slip, and was nearly down with me, on one side, finding cunningly that this gave him a momentary liberty, and advantage, by the embarrassment the rider is necessarily thrown into, he, for months after, would be trying at the same feat on every at all favourable opportunity, till it became quite a tiresome and vicious habit, and till at length I broke him of it by having sharp calkins made to the heels of his shoes, which holding him firm on all occasions upon the ground, prevented his sliding about, and I further remarked, that these calkins much improved his going in most other respects. Such hints may be thought by some almost superfluous, but there are others of my less experienced riders who may not perhaps be unthankful for them.

Also, horses at times are found to possess strong antipathies well worth our noticing, and they are sometimes astonishingly tenacious of them, which it may perhaps be best policy at times rather to give way to, than at too great sacrifice to be obstinate about conquering them, as they call it, and some grooms are very fond of this "conquering a horse," as they term it, but they too often however without achieving any good, worth speaking of, do the horse, or themselves perhaps, a grievous mischief, and repented of but too late. My own little stallion had a most prodigious aversion, to have his fore-top meddled with, or even combed, (from tight, ill-fitted halters perhaps, being put about his head whilst bringing up) and if any man attempted it, though ever so severely twitched, he would never cease to paw and kick with his fore-feet, so that the legs and thighs of his adversary were brought into eminent peril, so desperately so, that I never would suffer it to be done or attempted, but contented myself with a wet cloth gradually brought over this part from the mane, which he would quietly submit to, and vices and antipathies of this sort when unsuccessfully combated, are generally much increased—therefore, unless there be a tolerable certainty of success, they are for the most part best let alone.

BROKEN WIND.

PNEUMAROX.

BROKEN Wind is a disease frequently happening to horses. The following are the indications which mark its presence. The breathing of the horse becomes altered from its natural state, and from an easy, gentle, and uniform respiration is changed to a painful, laborious heaving, and violent agitation of the flanks, which rise by several successive undulations to a preternatural height, then suddenly relax and fall downwards beyond the natural extent of these parts; the nostrils become dilated, and held rigid and opened to their utmost extent, and the face becomes everywhere emaciated and contracted. Such are the appearances in very aggravated cases; in more recent cases these appearances are less evident, and it is a disease that can exist in every degree of mildness or violence.

When the disease has been of long standing, and little pains or care taken with the animal, as may be more particularly observed in cart horses, and horses employed in farmer's work in the country, the abdomen becomes large and pendulous; but in more recent cases, and in horses otherwise situated, we have observed that, in the early stage at least, the abdomen is rather contracted, and is painfully held up in this disorder.

Great thirst attends this disease, arising perhaps from the increased action or fever which it occasions, and which has been too often mistaken for the cause of it, and has led to the most cruel privations.

There is no disorder of the horse, perhaps, which has so much engaged the attention of anatomists, and of speculative ingenious men, as this, to discover its cause. It has, however, we believe, never yet been satisfactorily explained; at least, there is no author that we are acquainted with, that has formed any connected or probable account of it, unless perhaps very lately, and which was derived from the source we are about to mention.

Haller seems to have supposed it proceeded from a relaxed or ruptured diaphragm. Lower imagined that a relaxation or injury of the phrenic nerves might occasion it; some have assured us, after examination, that the lungs are not at all affected in this complaint, and that its seat was about the larynx and air-passages; and some of the writers on this subject have believed that the lungs were grown too big for the chest, and that this was the source of the mischief; and there have been many other conjectures equally absurd. Some thought they elucidated the nature of this disease by comparing it to a consumption, and others to an asthma. We trust something more natural and satisfactory will be found in the following statement of our observations on this singular disease.

In the year 1795, being engaged in the dissection of a grey mare that was sent to the veterinary college to be destroyed on account of this complaint, on opening the chest, the lungs appeared free from inflammation, being very white; and, as this viscus appeared free from redness and increase of colour, the general concomitant of disease, we were led for awhile to consider the lungs as not the seat of the disorder, as others had done before; now several of the pupils were present at this dissection, and on cutting into their substance no inflammation was perceivable: on examining them more closely, however, we observed a small bladder or vesicle on the outside of the lungs, in the external investing pleuritic coat; this was conceived by some who were present to be a tubercle, and that tubercles might be the cause of the broken wind. Suspecting however, from its appearance, that it was not solid, but contained air, it was punctured by one of them by my desire, and it immediately subsided. This instantly suggested to the writer of this article, that the lungs were actually in a state of *emphysema*, or in other words, that air was contained in a state of extravasation in their substance, and which not only seemed evidently the case in this instance, but which we have since fully verified by the examination and dissection of a considerable number of cases of broken wind, and found that in all it is the constant appearance. This extravasation of air into the substance of the lungs is perhaps

occasioned by a rupture of the air-cells, as suggested by Coleman at the time, unless it be formed in them, and is thrown out by some morbid operation of the blood-vessels, as sometimes happens in the intestines and *vagina*; for the exact way in which this emphysema arises has not yet been ascertained. It fully explains the cause of the white appearance of the lungs, for the membranes being separated and divided by air lodging between them partially admit the light, the puffy appearance they make also, and the crackling noise they give on the being handled, will all admit of a ready explanation by this discovery, and so do the symptoms which attend the disorder; for the common air escaping, from disease or a sudden rupture of the cells, into the membranes composing the lungs, thereby compress and obliterate more or less the natural cavities destined for the reception of the air, and thus occasion the effort we observe in overcoming this obstruction, and which naturally induces the appearances we have described as the symptoms attending this disorder: it also accounts for its incurability, and the oppression which a full stomach occasions. As the extravasation proceeds, the complaint gradually, or sometimes suddenly, increases, so as to be insupportable to the animal, and at length, being quite useless, he is necessarily destroyed. In other cases, the disease, without much increasing, may exist for many years, and indeed, till the horse dies from age, or other disease. This white appearance of the lungs it is that had deceived so long those who had been led through curiosity to examine the lungs in this complaint; it being so unusual to see any part in a state of disease, more delicately white than in its healthy state; and singular it is, that the extravasated air should not bring on an inflammation and destruction of these organs.

Horses, in bad cases of broken wind, are observed to void air in considerable quantities by the anus, as though the extravasated air of the lungs was absorbed and carried to the intestines; or it may probably be only disturbed digestion which is the cause of this; and the smiths, not unfrequently, on this account, cut through and divide the *sphincter ani*, then the power of closing the rectum is lost, and the air escapes without any noise; and they are led from hence frequently to imagine that they have cured the complaint.

We are now led to consider the cause, which in the general estimation of mankind, leads horses to this disease, viz. their being allowed too much water; and here, we apprehend, every observer of common feeling and humanity must be shocked at the recollection of what instances have fallen within his own observation of cruelty in this respect, and of what horses are daily and hourly suffering from the most barbarous of all customs, the denying a sufficiency of water to sound horses, to prevent their becoming broken-winded.

True it is, that water administered to horses in an improper manner, especially after the privation above spoken of, may become a cause of their becoming broken-winded; but would any one infer from this, that it is necessary that all horses should be kept almost entirely without water, exposed to a never-ceasing thirst, till an opportunity of gratifying the appetite in this way occurs, and the natural and healthful beverage being too largely taken, becomes a poison, and induces the very mischief which so much cruel and useless pains had been taken to avoid; for the horse that is allowed to drink frequently and as much as he likes, will never from this source become broken-winded. No horse on a common, exposed to the water of the brook, which he can partake of as often as he pleases, will ever become broken-winded from this cause, unless he had previously suffered a privation of water, and in his first excesses to overcome his thirst, injured himself. Let us now consider, under what circumstances it is advantageous to deprive a horse, for a time, of his water. The traveller, who starts in the morning on his journey, would be incommoded, if the horse's stomach was loaded with water; as it is quickly absorbed from the stomach, and, passing off in perspiration, becomes unsightly and troublesome; and though it may be true that perspiration not too heavy, by keeping a moisture on the skin, and by its evaporation, induces a coolness that might be refreshing, yet to be inundated with it would be highly disagreeable and unsightly. The water should, therefore, be given at an earlier hour in the morning, and should have time to pass off in a considerable

degree before the horse is used on the road ; and if he be deprived, in a great measure, of it during the day, he should be the more plentifully supplied with it during the night-time, so as not to create a violent thirst, which can only be gratified, the first opportunity that happens, at the expense of his health, or perhaps his existence.

Sorry should we have been, if, after much inquiry into the nature of this disease, we should have discovered that the above practice of depriving horses almost entirely of water, though cruel, was necessary ; and that we must acquiesce, with painful sensations, in the use of this custom. We are, on the contrary, convinced from experience, as well as the most incontrovertible reasoning, that the practice is as destructive and pernicious, as it is cruel and unnatural ; for we are aware, the suggestions of humanity would avail but little, where an opposite course would best serve the interests of mankind in regard to the animal ; however, they are, fortunately for it, not incompatible ; on the contrary, all the comforts he can receive will best insure his life and labours.

It should be recollected that the horse is fed on the dryest food, as corn, beans, bran, hay, &c., and this requires, to its being well digested, a certain portion of moisture, which must be either derived externally, or from the blood : and horses are often expected to work hard under these circumstances, to sweat and perspire profusely, and digest their food as well, without any water : the consequence of which is, that their dryness and thirst must arrive at a pitch that is scarcely governable : and to these causes we may add, as contributing to the mischief, the hot, crowded, low stables of large towns and cities, where they are often, in consequence of such treatment, seized with various inflammatory complaints, as affections of the limbs, eyes, brain, lungs, and other diseases. They are sometimes miserably allowed to wet their mouths on the road, and to have the water they are swallowing dashed in their faces, and this is deemed sufficient for their wants ; when, if they by any accident get to water, the consequences ensue that we have above described.

With chaises and post-coaches are ever seen the greatest number of broken-winded horses, and very naturally, because of the artificial and mischievous system pursued by the drivers of such vehicles naturally leading to it. It is a practice with the brewers' dray-horses, both in the metropolis and in the country, as often as they come home, to be let go to the trough and drink their fill ; among these, broken-winded horses are very rare, though they have all the water they can desire.

Wetting horses all over with cold water, while in a profuse sweat, we believe not to be so injurious a custom as would at first appear, if the law for its application is well understood, but, on the contrary, very beneficial and refreshing. Those who do it should be apprized of the danger of carrying it to the extent that would chill the horse, when the worst consequences would often ensue : to avoid ill effects, the horse, after this bathing, should not be left long, to stand still and chill, or in any cold place, or, draft of air ; but while his skin is yet warm (as in the case of a return post-chaise), he should be put in, and drove home, till again perspiration is fully induced upon the skin, when all danger would be prevented ; and it would be best, perhaps, not to repeat it at all, or at any rate, to the same extent, on his arrival home : as he is then to stand still in the stable, where there would be great risk of inflamed lungs, inflamed feet, or the gripes, from the blood being driven to and confined in the interior of the system.

Muddy water is often conceived to be the best for horses, and is given them in preference to clear, by some grooms. A horse, however, must arrive at an extraordinary degree of thirst before he would touch it ; and it is only better, as being in general warmer, having been exposed to the air and sun, and is certainly safer for horses than water drawn from a cold spring or deep well ; the contrast of temperature being too great with the horse heated by violent exercise ; to render the coldest water tepid, is generally an easy matter, by pouring into it a small measure of hot.

When the cause of any disease is not understood, the theories for its explanation will be numerous, vague, and unsatisfactory, and the remedies various, often opposite, and

almost infinite, and so it has been with this complaint ; for there is nothing can equal the absurd nostrums recommended in books of farriery, in this disorder in particular, as well as many others ; and the farther we go back, the more sure and sound is the information respecting it. The ideas of the Romans were coarse and absurd ; but the Greeks appear to have had a better knowledge of it, as is seen by the following translation from the Greek writers, given by Ruellius : “ *Cum in pulmonibus quid rupi caperit, hoc vitium πνευμονική, Graeis quasi pulmonis rupta diveris appellatur ;* ” and it is afterwards much better described, in a chapter given by Theophrastus in the same work, and at considerable length, too much so to admit of being inserted in this place. Whether, however, the term *Pulmonis rupta* did really convey to their ideas the actual cause of the disorder, may be doubted by the context, any more than that broken-wind to an Englishman, or *Cheval pousif* did so to a Frenchman. The ancients appear to have had a belief in its being curable, especially before it became inveterate ; the remedies they mention, however, may be fairly suspected of possessing any such power, and they understood not at all its cause.

We cannot conclude this article more usefully to the public than by cautioning them against the permission of a common practice, especially among the lower order of horse dealers, of violently squeezing the wind-pipe and throat, to ascertain if a horse be broken-winded, which is often attended with the most mischievous consequences ; the cough will be in proportion to the violence of the irritation used, and this, even in cases of broken wind, unless in the very last stage of it, when other symptoms sufficiently denote it ; so that, as a criterion, we believe it to be of very little value. In my case book is the following :—

A grey poney was brought to the Veterinary College, during the professorship of St. Bel in the year 1791, with great difficulty of breathing, a copious discharge of saliva from the mouth, and a running at the nose ; so far it appeared somewhat like glanders ; but the glands under the jaw, and all the external parts of the throat, were free from swelling. The difficulty of breathing was considerable, and threatened suffocation : this induced us to suppose some obstruction was the cause, either in the nostrils, fauces, or larynx.

The operation of bronchotomy was had recourse to, which immediately relieved him : present suffocation being thus prevented, our next plan was to remove the obstacle, which we imagined might be in the nose. The frontal bone was trepanned, and it was intended to trepan the nasal bone, but this was not executed, for the pus from the former found a way through into the nose, and the nose was injected every day, through this opening, with a warm decoction of herbs. As the orifice in the trachea every day became smaller, it was difficult to keep in the *canula*, which accidentally a few days after falling out, the horse was suffocated and expired. On opening the head, there was no obstruction anywhere to be found ; on opening the larynx, the true cause was discovered.

The internal membrane that lines the trachea or windpipe was enlarged or distended with a fluid, in a way that prevented the admission of air. For this membrane was detached from the sides of the trachea, and so distended with lymph, that the two portions met each other in the centre of the pipe, forming two hemispherical tumours, which acted as valves, and completely excluded the admission of air. On cutting into these tumours, they were composed of cellular membrane, distended by a small portion of fluid : the surrounding parts did not bear any marks of inflammation. If these tumours had formed on one side only, they might have been attributed, perhaps, to some puncture, or some injury from bleeding, or other cause of this sort ; but being on both sides of the throat, it is probable both sides must have been irritated, to produce it, and nothing so likely as violent compression of that sort we see men use when they propose to try horses for broken wind ; for they endeavour to squeeze the pipe till both sides meet, otherwise the horse will not cough, or only slightly. Since this, another exactly similar case was brought to one of the slaughter-houses of town, while we were casually staying there, and the horse was said to die of suffocation, they could not tell why. On examining the larynx, a similar mischief was discovered.

During the last six years (1805), we have opened more than ten horses that were broken-winded, and uniformly found the lungs emphysematous ; and since then, a vast number with the same results.

Violent breathing and appearances, in every respect like broken wind, also attend other affections where the lungs are injured, as in the case of large abscesses forming in the lungs, water thrown out in the chest, in roakers, and even violent pain in any part of the body, will produce appearances resembling broken wind, which again disappear when those affections are removed. I once saw all the symptoms here described of broken wind, brought on by excessive pain, which happened to a roan horse, from the pressure of the shoe upon the inflexion or intertortional part of the sole, or corn place, and to which the removal of the shoe, and its being considerably shortened at this part, gave immediate and lasting relief.

When the stomach becomes loaded, especially with water, all the symptoms of this disorder are greatly increased, and are then more easily remarked, especially on exercise ; it is, therefore, one of the most sure means of ascertaining it ; and on this account, horses with this complaint, are in general kept from drinking great quantities of water, which they are much disposed to do, probably from the fever observed to attend it, and also, perhaps, from the blood in the lungs not undergoing so completely the changes it ought to do in that viscus.

To ride a horse at all hard upon a full stomach, whether of water or food, would, by its pressure against the diaphragm and lungs be sufficient to bring on this disorder, and ought, therefore, always to be avoided.

Some horses are differently affected in broken wind to others : the respiration is quickened in some without much heaving, and the abdomen in such is contracted and hard, instead of being large and pendulous. It is also sometimes attended with a cough, which is not deep, but short and hard, as though the lungs resisted perfectly the impulse of this exertion. On exercise the cough is often much increased, after which he seems relieved ; the head in coughing is held low, his neck stretched out as though he endeavoured to bring something from his throat : “ *quasi ossicula devorasset*,” as the Greeks describe it ; and the face has a rigid emaciated appearance, resembling, though less violent, that constriction which attends lock-jaw. The eyes are often yellow from diffused bile ; and the nostrils, as we have said, dilated and rigid. The appetite, or desire of food at least, is not affected by it, if anything it is increased.

Dr. Baillý has also confirmed the same appearances as existing in the human asthma of some particular kinds, and it is accompanied with the same light colour and puffy appearance of the organs.

The writer of this article endeavoured to rupture the cells of the lungs of a sound horse, by inflating them, and laying weights upon them, and found that no moderate pressure would do it ; indeed when removed from the body, no experiment could be very satisfactory, and he desisted from farther experiments with this design, in this way. He also has found that the heaving of the flanks and the other symptoms were very much alleviated and relieved by a small drench of linseed oil, in the formula given in the *Pharmacopæia Equina*, p. 33, 3rd. ed. administered fasting, the horse being used upon it.

VICES OF HORSES.

ON THE SHYING AND STARTLISH HORSE.

By BRACY CLARK, F.L.S. and Member of the Royal Institute of France, &c.

BUT little appears to have been done, at least that we are acquainted with, respecting this very prevailing defect of horses ; every one appears at present, on these trying emergencies, to be left entirely to his own discretion, to get out of his difficulties as he can, without any settled principle or guide of action to help his efforts in this matter, which causes the very same errors to be constantly repeated from age to age, and at each new occurrence of the evil. And what dangers and disasters do we not daily see occur from gross misapprehensions in this respect. The present humble attempt at somewhat of a dissertation on this much neglected subject is merely intended as a beginning towards the removal of what appears to us to be a most flagrant abuse and misapprehension.

At this present time it appears to be pretty generally considered, that the shying or starting, or rather startling, of horses, is of the nature of an unpardonable vice, and which when given way to by the horse, as it leads to much inconvenience to the rider, is deserving of sharp correction, and punishment, and that it must be so overcome, and got rid of. One other remedy also is proposed for it, and which is generally admitted, that of leading or pressing the animal up to the object that is terrifying to him, that he may see there is no harm in it, and that he should not be so frightened at it another time. The venerable Xenophon even recommends such a course of proceeding. But which doctrine nevertheless after very many trials and much observation of the animal, we are led to believe, simple as it may appear to be, perfectly useless, and indeed something worse, when resorted to on the open road, of which we shall have to speak more fully hereafter.*

We have heard some few however, who used castigation for this offence, declare that they have

* That I may not be misunderstood, I would except the case of the military horse and his mode of education, when being confined within the four walls of the riding house, he is then presented with the implements, and ensigns of war, which are brought to him, and not as in the other case, he is made to approach them, and with the power, and means of escape. Thus presented he bears with them, and, after the flag has been shown him, it is made to pass over, and touch him, to convince him of its perfect harmlessness, and of its softness and flexibility ; the pistol also is flashed in the pan, and then is rubbed on his neck, and at length fired, with powder in the barrel ; he is caressed, and then he is led to his feeding trough, or food is perhaps brought to him on the spot, and he connects all these things as contingent acts, and takes a relish for them. The case is rendered very different when he is led, or forced, and especially by blows, upon any object in the open road.

subdued it by that means, but such we have generally found to get rid of their animals, which indeed is a very certain way of getting rid of all their vices, and of all defects, but if we were to speak the truth as we have found it, we should say for our own parts, that we have never seen otherwise, than that the evil was augmented in a seven-fold proportion by such violent, and unwise measures. We are also most fully assured and convinced of one thing, which is, that flogging, in man, or beast, never will be found a remedy for timidity; and if not to the reasonable creature, still certainly less so to an animal possessed of inferior powers of reflection. We are led, after considerable pains with the subject, to apprehend, that this animal, like all the others, was framed and constituted by his Almighty Maker with a disposition suitable to his own preservation, and protection, in that wild state, in which he first appeared, in order to guard him from the attacks of his natural enemies, and although he be formed a large and weighty animal, he was left unprovided with offensive weapons to fight his foes with, which if had he been possessed of, would perhaps have rendered him less suited, for the invaluable purposes for which he was ultimately designed, as the helpmate of man, and he therefore was constituted an essentially timid animal, and for the saving of himself by flight,* and therefore a pre-eminent speed, that is, for a weighty quadruped, was imparted to him, that he might not in such company as he would be at first exposed to, be utterly destitute of defence, or the means of avoiding the evil, but should be enabled to fly from his foes of the field, and if pursued by them, should use his hind limbs for his protection, which yerkt out with all the force he was possessed of, and enabled to give them, would stun, or indeed demolish, the best of them; his eye being placed prominently for this purpose on the side of his head that he might be enabled to direct his blow with the better aim behind him. And in vain had such a quality been imparted to him if he had not been also constituted an essentially timid and suspicious animal.

To this it will probably be objected, that his bravery is proved by his fighting in war, and under sexual desire; in the latter he fights with his own species; in the former he is acting under a complete delusion, for he is taught with the most sedulous care and pains, that the noisy implements of war have no harm in them, and that caresses, and a good feeding, are the sure rewards that follow after all displays of this sort.

If it be once admitted that he is by nature a really timid animal, and such I believe must be conceded to, by any one who will carefully consider him, then can he never be cured by that which can only serve to add to his fears, and apprehensions, viz. the terrors of the whip, the severest of all weapons! And many a rider have I seen contending by the half hour with his animal, in whipping him for shying, and in leading him by force to the object of his apprehension; and the result has only been that his aversion to it was at the next trial, greater than it was before. Some indeed have asserted their successes in this way, but the more candid, veracious, and really experienced horseman, would not I believe, at all confirm such pretence.

Perhaps our best guide in all dubious matters of inquiry is experience or the actual

* In confirmation of this view of the matter, my nephew Charles Clark, Veterinary Surgeon, who has been formerly very much in America, in the wild, and woody, and prairie, parts of it, says, that the mare that was turned out with her foal, was almost sure to lose it, in these situations; but that the cow turned out in a similar manner, with her calf, being more courageous, and armed with her horns, would, and did, protect it so effectually, as to save it. The wolves were supposed the principal assailants on these occasions.

experiment, and which has clearly to us after many trials seemed to manifest the fact, that this animal can never enter so abstractedly, into the nature of this punishment of flogging for shying, as to consider it a just and merited infliction, for a property which to him is innate and given obviously for the wisest of purposes, that he cannot therefore help, or at all entertain our views of the subject, and appears, as I think, invariably, to annex the flogging, at once to the presence of the object itself, as the attentive observer will discover, and so becomes only the more terrified on a second rencontre with it, and such has been the experience of other horsemen, with those at least that will tell the truth and not square and force facts and their results to their own pre-conceived notions and prejudiced reasonings.

However, that I may not be misunderstood at all, in thus generalizing on the subject, I will state what will not comport altogether with the above view, that it may not be imagined I have overlooked it, and especially as it is a very commonly occurring case, viz. that where the habit (for I will not at its first appearance designate it a *vice*,) has lapsed by ill treatment into a real and most formidable, vicious inclination, and disposition, sometimes even, to the searching for objects to shy at, which I have often had to see with others, and have also myself felt not unfrequently. And now let us a little enquire how we have come into this state of things, perhaps pretty much after this fashion. That a horse, we will say, young, gay, and timid, shies at some object he sees, which occasions his apprehension, and at which he is honestly, and *bona fide* really alarmed, and yielding to his natural impressions, he makes a startle, or a wheel about, his young rider, perhaps, seeing nothing alarming at all in such object, and thinking also that it is highly proper to check a rising vice at its commencement, in order to break him of it, commences flogging; the animal possibly a spirited one, not exactly understanding the sense of this discipline, resents it, and refuses to undergo the operation quietly, a struggle ensues, and in the conflict perhaps, he runs away, or unseats or puts in eminent peril of it, his young equerry, and has indeed much the best of the contest, and perhaps being not altogether so foolish as not to be unconscious of the advantage he has gained by his violence, he less fears a similar rencontre at a second opportunity, and becomes by a succession of repetitions of it, so emboldened, (and especially if he does not much like his bestrider,) that he repeats it for his own amusement, and undertakes to shy at an object, where there is really no fear, and will at last challenge his rider to the contest, and he in this way becomes a truly vicious and inveterate shy, and startler; in which case it may indeed be deemed a *vice*, but which has been brought on, or at least very much augmented by unwary councils and conduct.

From the above it would appear that it behoves the discreet horseman, to be much on his guard, not to bring about this state of things, by exhibiting too much feeling, or resentment on an occurrence of this sort, perhaps most accidentally occurring, and especially, if in a young subject, but rather to use conciliatory, and encouraging measures, with him. To do in fact as we believe it will be found most prudent often to do with young children, that is, not to watch too intently for offences, to punish them, but to pass them by, as a casually occurring circumstance, without much noticing it, and without indeed seeming to see it, lest by a too earnest notice of it, we may fix the attention too much upon it, and really lead to a repetition, and thus create a habit which severe reprehension will perhaps afterwards be but imperfectly able to conquer, since a frequent repetition of harshness will at last lose its effect. Let us however take the most

guarded measures, and caution, to remove every exciting cause, which can lead to a recurrence of the offence, or to any repetition of it, that it may pass away, and be forgotten, or if occurring again after a very long period, it may be passed over without being much regarded.

That the disposition in horses to be timid and startlish is natural and inborn, we apprehend there can be little doubt of, and therefore that it should not be too harshly dealt with, and that it is an error, that is at the beginning, and not a feigned one, we are well assured of. It must be also, acknowledged that this propensity is often of a most trying description to the rider, and demanding a patience "*a toute preuve*," the object shied at, being frequently of the most trifling and contemptible nature, at least to our views. And one shies at one thing, and another at another, in a way that is sometimes almost unaccountable, each animal having his own peculiar feelings in this respect. However it would indeed appear, that there were few things granted us in the dispensations of Providence without some drawbacks, or conditions attached to them, to call forth opportunities of exhibiting the virtues of self denial, and of forbearance, both towards our own species, and of other animals of weaker powers of reason than ourselves. And for those who cannot accept these annoying concomitants, or conditions, such are under no necessity, or compulsion, to resort to the use of them. There are however some horses that will bear with an astonishing fortitude both sounds and sights that are truly of a terrific character, even to us, so that the fault is not near so great as at all to go near to the denying them to our use, or to overbalance the inestimable pleasure, profits, and advantages we are enabled to derive from their services.

It may not be without its use in an Essay of this kind just to present a brief enumeration of a few of the objects which seem in a more particular manner to agitate and alarm them.

Of Noises, The dashing of water suddenly before them in the road; or the fall of a cascade. Any hissing or russling noise; all sudden explosions, especially when near. *As to sights*; The stumps, and trunks of old trees, especially if obscurely beheld or by an uncertain light, or behind a hedge. A plough, a harrow, or a wheelbarrow, a heap of stones, or a hayband, lying curling across the road, suggesting perhaps to them the presence of a snake, which in a state of nature is one of their fiercest enemies. Sudden breaks in hedges, or the sudden termination of a long wall, presenting convenient angles, and corners, for an enemy to lie in ambush, and suddenly dart upon them. Some are affected very much by the glare, and reflexion of light, from a puddle, or by the glittering of soap suds, thrown down in the road. Others are extremely alarmed at meeting coaches travelling fast; others again at tilted waggons. The bright arms of the soldiery and the noise and glitter of their accoutrements very much alarm some, while others scarcely regard them. Short sighted horses, and such there certainly are, are more timid than others, their vision being indistinct, they mistake objects from seeing them imperfectly. Where the *cornea* is too prominent, and convex, the rays are converged before the image is duly made upon the retina, so that shying will be with them a natural defect, and no vice at all. And none but experienced, and patient riders, should undertake animals having this imperfection, the glare of a puddle in the road is particularly offensive to such. Startling is also a consequence of imperfect vision from bleared eyes or glaucoma—my bay colt (Heathfield) during his being at grass in the marshes at Plaistow caught a cold, though at midsummer, and his eyes became affected with inflammation, increased secretion of tears, and white coagulum, in the corners of

his eyes, this continuing a few weeks terminated in *glaucoma*, or white, bleared appearance of the crystalline, without any distinct speck, or spot; which is frequently happening to horses exposed to chills, but the origin of which I had not before distinctly seen or understood till on this opportunity of observing it. He became in consequence of it very startlish. I found two or three hearty, not feeble slaps, on the neck with the hand, the best means of treating his timidity on these occasions, instead of whipping him; feebly doing it, however, is apt only to increase their apprehensions. It should be done honestly and firmly.

Some horses, but more especially mares, are of so timid and meticulous a character that none but experienced, and gentle riders, and patient ones, should mount them; and beating only increases the evil, for there is no making them to comprehend the abstract proposition that shying at an apprehended danger, which concerns their own and their rider's safety, can be a vice deserving chastisement; and then we see that horses will hardly shy with ladies, that shy badly with gentlemen, who are less patient over their faults, of which a very remarkable instance is related in my *Treatise on the Bits of Horses*, second edition, p. 38, to which we would desire to refer the reader's attention. To some horses the sight of an Ass occasions a wheeling about, and an expression of great dislike, and sometimes I have thought there was a degree of disdain, or affection mixed with it, as though despising an animal having a mean mimicry of their own more stately form, and as having more of the character of pride, than of real fear. Many other objects also alarm particular individuals, which it would be more tedious perhaps than profitable to enumerate here. One example we may here add, not unusefully perhaps, from the reflexions which accompany it, of a case of *starting*, or *startling* rather,* from one of the above causes though rarely noticed as productive of shying, viz. the abrupt and sudden termination of the long continuous surface of a wall, which occurred to myself some years ago, and which was not easily forgotten by me, or indeed the horse.

Being in the practice at one period of my life, on account of ill health, of visiting Bath, riding down for the benefit of the exercise on horseback, it afforded me the wished-for opportunity of making many experiments on their shoeing, and of observing many other things relating to their natural ways, tempers, and dispositions. Returning one evening from this city, it being late, and alone, on my little nag, that I had never known to shy before, on arriving at the end of the long

* At the present time we find the word "*start*," is as often used as "*startle*," to signify any hasty emotion of the horse from fear, and we believe both were original words in our language for this purpose. But although to *startle* still retains its original signification the word "*start*" has acquired a very different one; for instead of using the old compound of "*setting out*" or "*setting off*" from any given place, we now generally say he "*starts*" from it. This alteration of its meaning may perhaps have originated with some active knight of the road or commercial traveller for orders, who being desirous of impressing his employer with high notions of his zeal and activity in business, announces to him, not content with simply setting off on such a day, or such an hour, in the early morning, but that he will "*start off*," at such a time, that is, will be as sudden and quick in his movements as a horse shying from the road. The expression pleases, and being strong, tart, and pithy, it becomes eagerly caught at, and imitated by others, and soon becomes, though at first a mere metaphor, a legitimate integrant part of the language; but when the word, seen singly and without context, is presented to the lexicographer in its new sense, it becomes a complete puzzle, not aware of the original corrupt source of this application of it. This use of it, however, is become so general, that to say "*My horse started*," or "*I started*," is to use an equivocal expression. Therefore, where we mean to express the emotion of the animal from fear, we prefer the less equivocal phrase of "*startling*."

wall which separates Lord Craven's park from the road, it being twilight and rather obscure, when my mare, for she was of this sex, on reaching abruptly the extremity of the wall, as you go towards Newbury, suddenly missing this object gave a violent startle across the road in the opposite direction, and so abrupt, and unexpected, was the movement, that I was nearly unshipped; I however kept my seat, though with difficulty. I used however encouraging language, and soothed her as well as I could, and it appeared to pass off without any ill effects. Yet after this affair she became sensibly more timid and suspicious than ever she had been before, and would show traits of increased apprehension for a long time, but never so bad as to create much danger, or any great inconvenience; still well am I assured had I used intemperate measures she would have easily become an inveterate and dangerous startler.

So that we see how easily opportunities arise to create and arouse this latent disposition and propensity of their nature, and that this noble gift of a kind Providence was not dispensed to us without some conditions, to call forth the exertion on our parts of patience, forbearance, and discretion, and of our good nature, and philosophy also, otherwise we may easily make things very much worse than is at all necessary. It is true, that we ourselves, though rational beings and aided by education and reflection, have often fears about particular objects, in a degree quite irrational, and disproportionate to the real intimidation such objects ought to inspire us with, and which we hardly know how to controul or get rid of. So these inferior animals, often while they startle at objects that ought to produce but little fear, pass by others with great resolution, although of a character really terrific. That these are errors of judgment there is no convincing them by flogging, and if we compel them to go forward whilst under vivid apprehension, shall we not often increase it into real affright and terror. A man under the apprehension of approaching a precipice would he not, if hurried forward at an increased pace, have his fears doubly augmented, nor would he very soon forget any beating he received whilst under such apprehensions. And Xenophon, therefore, has well remarked of the effect of such violent proceedings, "*Qui vero verberibus eos cogunt, etiam metam majorem incutiunt.*" So that when the horse meets the object a second time, and feels the tightening rein, and the closing legs, of his rider, he becomes excited and alarmed to a great degree, and he will, therefore make the best defence he can, and try to escape the impending punishment, and the hateful object also causing it. Yet what is most astonishing is how soon these large, and noble spirited animals, can forgive a beating they have perhaps most unjustly received, if it be not quite of a description too severe, or has been repeated too often. For no doubt he conceives he is acting rightly in avoiding the danger both for himself and his rider, and has done nothing worthy of stripes; now we believe the best thing for the rider on the first appearance of such an event is, to appear as little disconcerted by it as possible, and to pass it by; yet occasions will occur that will try the most christianlike forbearance and patience.

In confirmation of the truth of these doctrines, and of their expediency in the use of these animals, I may relate another case that happened to myself, of a horse of extraordinary natural firmness being made a bad shyer, and his being brought again into a tolerably firm state.

About the year 1806, I bought of a Welsh drover, a young bay gelding, fresh from the country, at five years old, and which I rode on all occasions of business or pleasure, for about twelve months. His natural courage and firmness was such, that I often had to be astonished at it, in going my rounds through the thronged streets and lanes of the metropolis. No unusual

sights or occurrences seemed in the least to affect him, and no one ever rode him but myself ; no strange sights, obstructions, or noises, nothing seemed to disconcert him. At length it so fell out, that a young student at St. Bartholomew's Hospital applied to me to get him a horse, as he was shortly to go down to Bedfordshire, to settle in his profession as a surgeon, and he would want one to ride about among his patients. After trying for some time in vain to find him one to my mind, I was reduced to the necessity of telling him he might have my own well-tryed nag, if he would give me five guineas for the buying him, to which he readily consented, and took him with him shortly after to the country, using him in all his necessary avocations of business. It happened however, that being of rather a wild turn, business did not quite answer his expectations, and at the end of a twelvemonth, he returned to town again, and brought along with him his horse ; stating he had been much pleased with his services on the whole, and as he had no further occasion for him he would be glad if I would take him again. This I told him I had no objection to do, if he would give me five pounds for his twelve months' use of him, which he readily assented to. But what was my surprise on the morrow, on mounting him, and going my rounds among my patients, to find him startling at almost every object he approached, so that it was quite tiresome, and miserable to ride him. I began to repent much of my bargain, and on seeing my friend again the next day, I questioned him if he had not found my horse a shy, to which he replied in the affirmative ; and I then further questioned him if he had not well chastised him for his offences, when he also fully admitted that a due castigation had been plentifully supplied. I then told him I was very sorry for my bargain, for I had sold him one of the firmest horses I had ever rode, and that he had by his violence made him one of the most unsteady and startlish. He readily admitted the flogging had not been of much use in correcting the evil, to which I could most readily assent, adding only that it had much increased it.

As however the vice was formed, and I had bought, and paid for him, it was necessary for me to endeavour to bring him, as nearly as I could, back to his former firm state again. He was a spirited little animal, about fourteen hands high ; and on going out with him, the first startle he made, he flew about, and endeavoured to evade the restraint of the reins and bit, expecting to receive his accustomed flagellation, so I took care to ease his fears in this respect, by slackening the reins to him in an unusual degree ; and, instead of giving him the whip, encouraged him all I could, by soothing language and patting his neck—indeed to quiet him the more, I took no whip out with me, and by this treatment in a little time composed him, and broke through the almost indissoluble connection of shying and flogging. His apprehensions became daily less, and after awhile having him in constant and daily use, they nearly entirely subsided. If he showed any symptoms of startlishness, the handle of my whip laid firmly on his neck was sufficient to quiet him ; and in this state, a few months after, I sold him to my esteemed friend, Luke Howard, Esq., the ingenious author of a Treatise on the Classification of Clouds, and of three most valuable volumes on the Meteorology, and Climate of the Metropolis, and he never, that I knew of, made any complaint of his having been troublesome in this respect.

So that we see flogging is not a remedy for startlishness, as generally conceived, at least practised ; and that no notice at all, or as little as possible, and that of an encouraging kind, will best answer our purpose on those difficult, and often dangerous occasions. It is, however, with sorrow to be admitted, that there are some horses so extremely timid and ungovernable,

especially if they have been much flogged for it, that hardly any treatment will afterwards reduce them to perfect order; especially, if as we have stated, of the female sex, that the utmost care is requisite with such, and they should have riders only that possess both skill, and experience, and courage, and great self-possession; and along with this, there should be also, in very extreme cases, a total change of measures, and of scene if possible, and if it were possible, even of the changing of masters to the gentler sex.

Timidity, and apprehension of insidious attack, are the inherent attributes of these noble creatures, which as we never can remove, we must combat therefore the difficulty in not considering it any longer as a vicious disposition, by endeavouring to qualify and render it less annoying by encouragement and soothing, the only palliators of a truly timid animal. When the rein is slackened to them, their apprehensions are generally very much abated; and if we even make them, if they wheel from the object, and there is plenty of room to do it, to wheel farther and more round about, than they wish or are inclined to do, when finding that they go over more ground by it to no purpose, they are willing at last to desist from such practices. The consequences of imperatively forcing them upon a terrifying object will be seen in the following paragraph, taken from a newspaper; for, though indeed they are endowed with a certain degree of shrewdness and cunning, in general they are not animals of very deep reflection, as indeed their physical organisation would sufficiently point out, and lead us to apprehend:—

“As the two o'clock train of carriages on the London and Birmingham Railroad were passing near Watford on the 12th of Nov. last, a fatal accident occurred. One of the labourers at work on an unfinished part of the road was holding a horse close to the line of trams, when the animal becoming frightened by the noise of the train, shied, and unfortunately threw the man under the track of the engine. His body was nearly severed by the contact of the wheels and steps of the carriages, and death shortly ensued. He had ample time and room to avoid any mischief, but remained within reach of danger, apparently out of mere carelessness or intentional bravado.”

It may sometimes happen indeed, that in a narrow way on a sudden rencontre, it may be difficult to permit the execution of the above recommendation, of giving them scope, and of not too much coercing them, which in general indeed is vain beyond their own permission—yet by doing it in situations that will admit of it, they will the sooner be brought into a state of greater obedience in the more difficult cases or situations, that will render them more easy of controul, and the wilfulness of shying much less.

It is also greatly to be regretted, in the lives of these poor, inoffensive, and worthy animals, that when treated in one way, they soon after perhaps fall into other hands and get treated in all respects just the reverse, from ignorance and want of judgment, and thus have their whole line of conduct to learn over again; this arises from the want of general principles which shall be acknowledged, and from the total absence of proper schools and teachers at this day, both for the animals themselves and their conductors, the establishment of which, in all cities and large towns, would hardly be attended with any expense or difficulty. Every beginner through this, has to go through all the errors, misapprehensions, and perhaps mishaps, that he can commit or experience, before anything like a sound thought, or idea gets possession of him, and this is generally but a too dear-bought experience.

A future half sheet is intended for the consideration of Blinkers as a remedy for shying.

In compliance with the wishes of my valued friend John Field jun. I undertook to break in, or rather to accustom, his blood chaise mare, a spirited creature, to go without blinkers, which she had been always used to till that time, and she was then about seven years old. My friend Robert Dawson, a riding-master by profession, assisted me in this attempt, and much more easy we found the task than we could *a priori* have believed, and which vulgar prejudices had led us to apprehend.

We made the first trial of this mare, for safety, in his riding-house, of which I gave a particular description to my friend Field at the time, but which, as the letter containing it appears to be lost, I now endeavour to supply from memory as nearly as I am able. We began our experiments by putting her in a light cart that she had been used to draw before with blinkers; these being now entirely removed, one of us leading and the other driving, we took her round the school, first at a walking pace, afterwards on the trot, both of which she performed perfectly well, without showing the least fear or disposition to be riotous; indeed, so well were we pleased and satisfied with this first lesson, that we determined on the morrow to go out with her into the open public road, both of us riding behind her in the cart. In our passage we met many people who stared very much to see the mare without any blinkers, and asked if we were not afraid; we asked in our turn, at least to those who appeared on horseback, whether they were not also afraid, and advised them to resort to blinkers without delay, which caused some smiles, struck with much the same obvious necessity for it in the one case as in the other. We passed along the road to Kentish Town, and nothing that we overtook, or that overtook us, in the least disconcerted the mare. From Kentish Town we went back into town again, along the high road, and drew up in Wigmore Street opposite the door of our friend Field, that we might show him there was no danger whatever in the experiment, with this animal at least. She was then driven in the same light cart back to Dawson's in Gray's Inn Lane, where she was kept and exercised about a week or so, and was then returned as trust-worthy without blinkers, to her owner, who shortly after set off on his journey on commercial concerns of business, and after being out with his amiable lady in the chaise with him the whole time, (two or three weeks,) he returned and favoured me shortly after with the following letter:—

12, Wigmore Street, Sept. 28th—36.

MY DEAR SIR,

I am just returned from my journey of three weeks in Kent, &c., and have great satisfaction in stating to you, that my mare has gone most delightfully without any blinkers to the headstall, and certainly with greater cheerfulness than I ever knew her heretofore.

She now never attempts to shy as she formerly did, and as I suppose from her seeing every object perfectly well, whereas before, her sight imperfectly and partially blinded by the blinkers, was a real source of shying, which before, as I have stated, she did and not unfrequently.

I may also add that I have a little Shetland pony which Mrs. F. drives, and which went very unpleasantly and shying at times with the blinkers, but on the removal of them she has also gone as well as I could possibly wish, and continues so to do to this day, so that nothing seems "to frighten her."

I have cause also to speak decisively in praise of the new headstal with the occipital strap thrown back upon the neck, instead of galling the base of the ears, and the exposed spinal chord, between the first and second vertebrae, or pithing-place, as it is called. She is now sensibly relieved, and carries her head higher and better, favoured also as I believe by the omission of the bearing-rein and of the lateral tag and ring, to deflex its course, a circumstance first exposed by you in your excellent *Treatise on the Bits of Horses*. The effect of these alterations upon the above mare was indeed very remarkable, for before I used the headstal so arranged, she had been always very touchy, and shy, about the head and ears, so much so, that scarcely could any person apply this apparatus to her head without experiencing the greatest trouble; whereas at this present time she will hold down her head to have it put upon her, so that a child might harness her.

I could with great goodwill further enlarge upon this agreeable subject, of such eminent satisfaction has it been of to me in my various journeyings in the country. In respect also to the bearing-rein, I can now add to my former testimonies in respect to its grievous effects, that I am satisfied it not only injures the windpipe as you state, but the lungs also, as any obstruction to the free passage of the air through this main canal either in or out, will cause a distention and reaction upon the cells themselves of this very important viscus.

I am, My Dear Sir,

Yours very truly,

JOHN FIELD, junior.

If further corroboration were necessary, I might advert to the practice of my nephew Charles Clark, of Giltspur Street, London, who, to a very spirited horse that he drives in his chaise, has never used this clumsy contrivance of blinkers for about six years, and finds his horse all the quieter for it. My friends Moline & Co., ale and porter venders near London Bridge, have also done the same for some years. Not only is the weight, but the expence of the blinkers is no trifle, as the more leather is consumed in their manufacture the more they can be charged; and truly heavy and solid many of them are made, which besides a good deal of expensive work about them, have at times heavy metal ornaments laid on them.

These blinkers attached to the lateral straps of the headstal, their weight is oppressively felt by the horse; these again are resting upon the occipital strap, which now-a-days is lodged directly behind the base of the ears, fretting and chafeing them, is also contributing to the pressure upon that tender part the *atlantal hiatus*, or *pithing-place*, where the base of the spinal marrow is so extensively exposed, that a penknife blade entering there would be immediately fatal; indeed it is the most sensible part of the whole horse. This uneasiness is often manifested by a seesaw motion of the head, which, instead of being attended to, as it is the only mode of expression they can use, is generally responded to by sharp lashes of the whip till they desist. It is most clear also that the ancients were not used to employ these clumsy blinkers, as may be readily observed by the Chariot race of *Anniæ Arescusa*, seen in the frontispiece of my Essay on the Shoeing of the Ancients, taken from a valuable ancient *terra cotta* in the British Museum, which once formed part of the Townley collection.

A SHORT HISTORY OF THE CELEBRATED RACE-HORSE, ECLIPSE.

NEITHER the ancient Hippodrome nor modern race-course can furnish perhaps so splendid an example of superior powers, as do the annals of the famous race-horse *Eclipse*, whose performances were of a description that rendered competition useless with the horses of his day; and such was his pre-eminence, that he at last was suffered quietly to receive his laurels by walking over the ground, where no rival appeared to dispute his matchless claim. The bones of this famous horse would form a valuable acquisition to any public school, or to the hall or hunting stables of any nobleman or gentleman desirous of making so curious an appendage to his establishment, as they must ever obtain from the celebrity of the animal a share of interest and curiosity. They may be securely referred to as an unexceptionable model on which to calculate speed in horses; and from them may also be seen, at any period, if there be an increase or falling off hereafter of bone in length or size, in our breeds of race-horses, which may be readily ascertained, and in what degree, by his remains. The peculiar make and exact *tourure* of his bones may also be known, which no pencil, however skilfully handled, could convey so accurate a knowledge of.

The following is a brief record of the interesting circumstances which attended his life, and of the chief of his exploits on the turf.

He was foaled in Sussex, in the stud of the Duke of Cumberland, our late revered king's uncle, and the hero of Culloden; his sire was *Mark*, his grandsire *Squirt*; his great grandsire *Bartlett's Childers*, which was full brother* to *Flying Childers* of Devonshire, supposed to have been the fleetest horse, for a moderate weight and distance, that ever took the field. These Childers breed can be readily traced in

their descent from the *Darley Arabian*, imported into this country from Aleppo by this spirited merchant, early in the reign of Queen Anne, and which came over to England certificated with all the ceremony due to the very best blood of the Desert.

On the side of his dam he was descended of *Spiletta*, got by *Regulus*, the son of the Godolphin Arabian, whose pedigree is very well understood.

On the death of the Duke of Cumberland, his stud in Sussex was sold off; and the *Eclipse* colt, then a yearling, was purchased by a sporting Smithfield salesman, for the sum of seventy-five guineas.* An incident attended his sale, which is worth relating, as his life might have been in other hands of perhaps quite another description, and with none of that splendour which followed him, so much depends upon the characters of men and opportunities, as well as of the things themselves. Mr. Wildman, (for that was the name of this Smithfield amateur), having the young colt in view, arrived at the place of sale some minutes after the auction had commenced, and the *Eclipse* colt, being placed among the early lots, had been actually knocked down for seventy guineas, and sold. This spirited lover of the sport was not however to be daunted by this untoward circumstance from an attempt to gain him; and, referring immediately to his stop-watch, of trusty workmanship, he declared in the face of the company and of the auctioneer, that the time the bills had stated for the commencement of the sale had not then arrived, and insisted boldly that every lot should be put up again. The auctioneer, well knowing the stiffness of his man, and, unable to disprove the allegation, thought proper to comply; and to save the

* By full brother is understood by the same mare and horse.

* From this probably originated the vulgar notion that *Eclipse* was once sold in Smithfield at the open market.

trouble and time of the company it was finally agreed that such lots as he required should be put up again; and Eclipse was once more put up, and a second time knocked down, at the sum of seventy-five guineas, being an advance of five on his former sale.

This remarkable horse was also not without portentous events on the day of his birth, for he was foaled on the very day of the great eclipse of the sun, on the 1st of April, 1764, and hence he very naturally acquired his name, which from this accidental circumstance is now become in our language almost synonymous to swiftness and speed; as coaches, ships, steamboats, and all other sorts of vehicles having any distinguishing pretensions to velocity, are all now called *Eclipses*, arising out of this casual circumstance.

After the period of his sale, he was kept chiefly in the neighbourhood of Epsom; and, from some cause or other not now exactly known, was not brought into public notice till he had attained his fifth year, which, no question, was attended with many advantages to his general strength and the state of his feet; and, for the first time, he was started on the sweet scented turf of Epsom Downs, on May 3, 1769: he was matched against some reputed clever horses; Gower, Chance, Trial, and Plume, were his opponents; and he distanced them every one, winning for his owner a considerable sum of money. John Oakley, they say, had the honor of riding him on this occasion, and in general or perhaps always afterwards,* and to whom it is said this generous animal was much attached; but, although this jockey was deemed a skilful and powerful man, yet this brave animal did not require, they tell us, much of the aids of jockeyship, or would permit in any way the use of the whip or spur,

or much directing; the sole business of the rider was to keep his seat, and pull in, the rest was done by the horse. In a race that was expected to be sharply contested at York, O'Kelly placed several persons across the line of the course, beyond the coming-in post, in order that, if he broke away after winning, he might be stopt; but it was a needless precaution, for, after the race was won, he seemed to understand it, and readily obeyed the rein.

On this occasion at Epsom, they say, "*he was pulled*" the whole of the last mile with all the might of his rider, yet he distanced the whole, notwithstanding; since, for certain obvious political reasons, it was not desirable to his owner his prodigious powers should be at once disclosed.

It was after this race that Capt. O'Kelly purchased the half of him of Wildman for the sum of 450 guineas; and after a subsequent race at Winchester, he purchased the remaining half for 1100 guineas; yet, for all this, was he the cheapest horse ever sold in England, having by his valuable properties of one kind or other netted for his master the prodigious sum, it is said, of £30,000.

Among other bets on this race, one was made which was rather singular, by Dennis O'Kelly himself, "that he would undertake to place the horses:" after the bet was made, he was called upon to declare, and he said, "Eclipse first, the rest no where;" which was true, in a sporting sense, for a horse distanced might be said to be no where, or in no place.*

* It is stated that he was broken in by a daring character of the name of George Elton or Ellers, who was afterwards transported for poaching, and that he often rode him into the thickest of the forest, to overcome his intractable impetuosity, having previously defended his thighs and legs with stout leathers.

* His being backed four to one at starting in this race, for his superiority, though endeavored to be concealed, had got abroad among the turf people, and the manner this happened has been related as follows. Some persons engaged in the fancy were dispatched from London for the purpose of taking a sly peep at a private trial that was to be made between Eclipse and some other horses before his starting for the race; but they arrived too late, for it was just over; but an old woman, as it happened, was found near the spot toddling along, and of her they enquired if she had seen any thing of the trial: she told them, she did not much understand what they meant; but, if it was the two horses they were talking about that were running, she could tell them that white legs was a long way first, and that t'other, she was sure, run as fast as he could, would never overtake him. This was sufficient; they returned to town, and the

His next race was on Ascot Heath, on May the 29th, of the same year, 1769, where he beat Fettyplace's *Crème de Barbade*. The betting here was eight to one on Eclipse, and, though only five, he carried away the king's plate for the six years old horses.

At Guildford, June 5th, of this or the next year, he walked over for the king's plate.

His next contest was at Winchester, on June 13th following, of the particulars of which nothing more is known than his beating Turner's *Slouch*, who had won the king's plate at Guildford just before: ten to one was betted on Eclipse after the first heat. He carried away also the £50. purse, beating the Duke of Grafton's *Chigger*, Gott's *Julia*, O'Kelly's *Calliban*, and Bailey's *Clawville*. On the 15th he walked over the course at the same place, for £50. weight for age.

At Salisbury, June, 28th, no horse meeting him, he walked over the course for the king's plate for six years old, carrying twelve stone; and the next day he won the city silver bowl, with thirty guineas added, for any horse carrying ten stone, beating Fettyplace's *Sulphur*, and Taylor's *Forrester*, distancing the first.

At Nottingham, July 3, he walked over for the king's plate.

At Canterbury, July 25, he walked over for the king's plate for six years old, twelve stone.

At Lewes, July 27th, he won the king's plate for six years old, beating Strode's *Kingston*: ten to one on Eclipse.*

At Litchfield, September 19, he won the king's plate for five years old, beating Freeth's *Turdy* by Matchless: twenty to one on Eclipse.

At Newmarket first Spring meeting, (Tuesday, April 17th, 1770,) Eclipse beat Bucepha-

lus, got by Regulus, of his own lineage on the dam side; this was run for on the Beacon Course. Wildman staked 600 to 400 guineas on this race, six to four on Eclipse.

On Thursday, April 19th, he won the king's plate for twelve stone, beating Strode's Pensioner, Fenwick's Diana, and the Duke of Grafton's *Chigger*, Pensioner being distanced at starting: ten to one on Eclipse.

At the close of this year no horse would start against him, and he received the forfeit of 600 guineas at Newmarket, the king's 100 guineas at Guildford; the king's 100 guineas at Nottingham, and £317. 10s. beside.

At York races in this year, 1770, August 20, two horses were brought against him, Wentworth's Tortoise and Bellario, bred by the noted Sir Charles Bunbury. Eclipse was more than a distance at the end of two miles, and won the race with the utmost ease, twenty to one on Eclipse.

At Lincoln, Sept. 3, he carried away 150 guineas, and again at Newmarket, Oct. 3, 150 guineas, beating Sir C. Bunbury's Corsican; and the next day he walked over the round course for the king's plate. *Turf Reg.* p. 15.

He was then put out of training, and covered mares at Clay Hill, near Epsom, at 50 guineas each, afterwards at 25, till near his death.

They relate also an anecdote of this jockey, John Oakley, and of his horse, which we ought not to omit. It was several years afterwards, and that he had done racing, being very decrepid and foundered in his feet, from the joint effects of shoeing and of racing. It being required that he should be conveyed from Epsom to Canons, in Hertfordshire, the seat of his master O'Kelly, a four-wheeled car was made on purpose for him. In this car rode John also, and baited with him at the stopping places on the road; so that, in the words of the poet, he had almost become "*demi-natured with the brave beast.*"

owner was surprised, on his arrival, to find the betting so high in his favor; he however took the odds, and won much money.

* The writer of this is however credibly informed by some old people, who were eye-witnesses of this race, that he was on this occasion certainly ridden by one John Whiting; that Oakley appears to have been his constant groom, but whether he generally rode him, as Lawrence asserts, is not certain.

Eleven king's plates, in all, were won by Eclipse; and the weight he carried was twelve stone, except for one, which was ten stone.

His color was a light chesnut, or sorrel-chesnut, the off hind leg white from near the top of the shank to the foot, a white blaze also from his forehead to his nose. His exact height has no where been stated that I have seen; but, those who have seen him living, guessed his height to have been fifteen hands and a half. The best portrait of him is done by the masterly hand of Stubbs, to whose extraordinary merits and undeserved neglect we have to bear a sad testimony.

This famous horse was not only the best that ever this country saw as a racer, but he was no less so as a stallion, for his progeny, by their feats upon the course, in 23 years won 344 races, producing to their owners the extraordinary sum of one hundred and fifty-eight thousand pounds, various smaller sums and forfeits not included.

His exact speed was never known, as no horse could be found to call forth his extreme pace. His collateral ancestor, Flying Childers, was supposed to have done a mile in a minute; if this be admitted, and it were possible he could continue such a pace without intermission, he would in seventeen days and nights and a few hours, measure the belt and circumference of the whole earth, and arrive at his stable again, if no obstacle opposed him, before the eighteenth night. The circumference of the globe, from the most correct computation, being stated at 24,855 miles.

If we examine his make in the portrait, as well as in the skeleton, the most marked difference is in his croup, which stands particularly high, owing to the length of his hind limbs; and his thigh bones are, for a blood-horse, of an enormous size, which, if provided

with proportionate muscle and energy, must give him great superiority. It was also remarked in his gallop, that his hind legs were very wide and separated; the width of the haunch bones and pelvis, which also partook of this increased volume, would account sufficiently for this appearance, the hind legs being parallel columns from the haunch, and not approaching upwards, as do the fore limbs.

His fore legs are also remarkable for good symmetry, and their exact perpendicularity of direction.

His fore feet were dropped in the hoofs and foundered, and his coffin bones were very much rounded and diminished by absorption from undue pressure upon the sole. He was thick winded, probably from some error or exposure in his bringing up. He died at Canons on the 28th of February, 1789, of the gripes, at the age of twenty-five years; and cakes and ale were given at the funeral of his flesh, after the manner of the Godolphin Arabian; for his skin was preserved, and his bones were nicely cleared of every covering but the ligaments that held them together, by the masterly hand of Sainbel, the first professor of the Veterinary College, and an excellent anatomist, in which, more than in any thing else, he excelled. Sainbel has stated, in his work on Eclipse, that his heart weighed fourteen pounds,—a remarkable size for a blood horse.

Sixty guineas were offered by the College of Surgeons for this remarkable skeleton, it being intended to be placed in their museum; but the sum was refused. A hundred being the price fixed for this king among horses.

REVIEW OF WM. YOUATT'S PUBLICATION,

CALLED

'THE HORSE.'

It was not till this day, June 10, 1854, that accident threw in my way this publication, which, as it appears to contain matters derogatory to the interests of the public in the use of these beneficial and delightful animals, and entailing an increase of suffering to them, so I feel called upon to make on this work a few passing remarks.

Charles Clark and myself often wondered, in attending sick horses with inflamed lungs (a not very infrequent complaint), how it could be that before our arrival they had been dosed with an enormous quantity of common linseed oil by the common farriers; and as it was a perfectly indigestible body in the Stomach, and most inveterately nauseous and disgusting to the animal, and, also, as no medicine given afterwards was of any avail upon such a mass, so they uniformly died. (Calling it sometimes castor oil, which also, we know from actual trial, is not an effective purgative with the horse.) We said one to another, how comes it they have got into this vile practice, seeing that no man we know of, or any author whatever, has ever recommended such a course? But what was my astonishment when yesterday, stumbling upon this publication, I found in it this very recommendation, at page 212, and which determined me to a further scrutiny of its contents; and found much other objectionable matter, which I thought worthy of public attention, and especially by the veterinarian and the possessor of horses. Youatt appears, indeed, to have been a man of some natural talent or gift of freely expressing himself, of which this book affords demonstrative proof. His later publications in the 'Lancet' were, however, in much better language, in which it would appear he must have received help.

In a subsequent part of this volume he puts this detestable oil into his physick ball also,* as he calls it, by which he means purgative ball, from whence possibly this incongruous article crept into 'Morton's Pharmacopœia,' as it is also there recommended in his *physick* ball; and to his—Youatt's physick ball—is then added that usual resort of ignorant prescribers, *calomel*, by no means a purgative of the horse, but a bitter, griping, tormenting article; and why this calomel should be given does not appear, when more effective and assuredly milder purgatives might be had recourse to. It is true, at last comes a small smattering of aloes with it, which given alone, with a little treacle for consistence, would have done the business properly, and without any danger of suffering or uncertainty at all.

He next has a chapter on *Thick Wind*, a rather anomalous affair, and probably the effect of plethora only, or of an incipient broken wind, and not a specific disease. He speaks also of lungs becoming *fat*—miserable indeed would it have been for the poor animal if this viscous could have been so affected with fatness,—and also of *PUMICED FEET*. We have shown elsewhere, such to have been merely foundered feet, permitted by protracted age to assume this tumid, spongy appearance.

Youatt, in his account of *Broken Wind*, has not condescended to make any mention of my name, as having first discovered that it proceeded from an emphysematous state

* This execrable practice of giving oil originated in France, see Buletin Veterinaire p. 614.

of the lungs from ruptured air-cells, letting out the air into the intervening spaces between the cells or membranes, and thus puffing them up; and which is now found to be the origin and source of several obscure species of human asthma. (See, for further particulars, 'Rees's Cyclop.,' art. *Broken Wind*.)

We here have a disease which he calls by the strange name of *Stomach Sluggers*. What it is we are at a loss to conjecture, not finding any such disorder in any veterinary or farriery publication we happen to be acquainted with.

Cutting out the feet of horses sent to be shod, he strongly recommends, and which is indeed the besetting sin of all the lowest order of farriers; and though it be true that, that truculent weapon, the butteris, formerly so destructively employed in notching the inflections, is now done away with, still that vile instrument, the *sharp-drawing knife*, is most officiously wielded in its place, in slashing the frog, and often in laying open to the quick, the flesh of the foot, and which thus exposed to wet and dirt, soon becomes a *canker sore*, of most difficult cure, and of infinite trouble and loss—that, instead of recommending this cutting of the foot, he would, we believe, have done much better in a strict and urgent admonition to moderate or avoid this baneful practice. The smiths, if reproved for thus acting, tell you in excuse, that the masters or owners of the horse "will have it done," and that they have sent word to that effect to the forge. Now, the fact appears to be, that the smiths engaged in this practice (and rather fond perhaps of exhibiting their dexterity with the knife) persuade the grooms how necessary it is to be done, and that they should inform their masters of it, and to insist upon the feet being *well pared out*—making them instrumental to their own injury: hence the order, when such really comes. But they get into a ready way of making this excuse, when, in reality, no such ridiculous order had ever been sent, for the public at last begin to know what dire injuries grow out of this practice. And most certain it is that a country bumpkin, quite raw and un instructed in the anatomy of the foot, coming into a forge, enamoured with his new drawing-knife, could fiercely do more mischief in two minutes than two years of the most prudent measures could ever restore. There ought indeed to be a school formed for the previous instruction of these men, in the good knowledge of the horse's foot, before any permission is granted them to enter the forge; by which nearly all this evil would be avoided. There is also in this volume a miserable appearance of crouching and truckling to the trade, which is shown by his concealment of, and blinking at, the well-known effects of the common shoe, when applied in the common way of nailing, in reducing and diminishing the volume of the foot; and this is done in order, possibly, to curry favour, and obtain a more extensive sale and circulation of the volume amongst them.

In his chapter on horses eating *poisonous herbs*, he recommends to be given them *vinegar and gruel*, on what authority we know not; but we believe firmly had he recommended instead, some warm spicy medicament in proof spirit, it would have served this purpose much better, and by thus exciting the action of the stomach to an increased power and activity of digestion, he would have obtained a digestion of these said matters, and then their poisonous effects would have been done away with, as may be seen in our account of the digitalis in the '*Pharmacopæia Equina*.' Fond of the shop and its enticing articles, he orders *corrosive sublimate* to be administered to the horse in ten-grain doses, twice a day! We believe, if strictly complied with, many a brave animal would have been sent to his lasting quietus by such a physicking. Next, he obliges us with his notions concerning the *bots of horses*; and here he honours my name with a mention, the only one in the book, and describes the grub of the *æstrus equi* of my enumeration, but omitting altogether the three other species, which in their grub state infest also the stomach of the horse,

viz., the *hæmorrhoidalis*, *veterinus*, and *salutiferus*; the first of these, the *hæmorrhoidalis*, it is, that hangs to the fundament of the horse in quitting the intestines, and not the *æstrus equi* of my enumeration, as he supposes. By a strange mistake, or inadvertence rather, the great Linneus has described the real *æstrus equi* under the name of *bovis*, or the *ox bot*, supposing it was the same bot infested both animals. But for a more full account of these most curious insects and their ways, the reader is directed to the 'Linnean Society's Transactions,' vol. iii, p. 289, and vol. xv, p. 402, where he will find all the species at present known enumerated. Also, we may observe, these larvæ of the *æstri* do not adhere in a general way, as he imagines, to the white dense covering, or *epithelium*, which is lining the upper half of the stomach, but are found sticking to the red membrane near the pylorus.

We now come to his account of the *spasmodic colic*, as he calls it, viz., the dangerous *gripes* of horses; and his cure for it consists in the giving "*turpentine, bleeding, opium, and calomel*, and running them about." By *turpentine*, he probably means spirits of turpentine, a fiery fluid, whose acrimonious nature we have elsewhere exhibited in our treatise expressly on this complaint. And next, as to the bleeding, we should apprehend such a proceeding would rather tend to debilitate the system, than rouse the digestive powers, the main object to be sought and kept in view in this case, seeing that the disorder is simply at first only an arrested digestion. And, assuredly, *opium*, if given here, would have a directly sedative effect, in no way conducive to the object sought for. And, lastly, *calomel* is certainly no provocative to digestion, but would, probably, by its great weight, remain inactive at the bottom of the stomach till the case was decided in death or recovery. And "as to running the horse about" in a state of intense suffering, it would be almost certain, as we have repeatedly known, to bring on an entanglement of the bowels if at least the case should have been a violent one. In proof of this, we may refer to a noted case that happened in the King's Stables at Brighton, as narrated by the artist himself in the 'Veterinary Journal,' vol. ii, p. 318, where the article turpentine was indeed plied, *à l'outrance* to both ends of the intestinal tube, and the running about also was not omitted. He died, however, to the great chagrin of his royal owner, for he was one of his best horses. Other examples we could adduce, but for the most part they are but little spoken of.

We are led to pay great attention, in the early part of our practice, to these deplorable occurrences, entailing ruin sometimes to the poor man, and often to the rich no little anguish. At length, by watching, dissection, and care, we arrived at more clear notions of the treatment required, and saved afterwards nearly every case that occurred, of which we here give a scanty outline for the sake of its more general diffusion, referring the reader, however, for more extensive particulars, to our express dissertation upon it. (2d ed., London, 1837, pr. 3s.)

The arrested digestion may arise from several depressing causes, such as chills from draughts of air, or showers of rain wetting the skin, from too much food taken in the stomach at one time, or too greedily eaten, or not being sufficiently chewed, or it may have been of an improper nature or in bad condition. The digestive action once arrested, a chemical action succeeds, and the fermentation extricates air; this air distending the intestines almost to bursting, creates intolerable suffering, and the intestines contracting on the air, induces sometimes spasm. The horse lies down, paws with his fore-feet, rolls, kicks, and flings himself about, every now and then looking earnestly at his flanks. The undigested mass getting dry by the heat, increases his suffering, and soon brings on mortification and death.

After the knowledge gained by several unsuccessful cases, and instructed by dissection after death, and watching the course of the disease, we found the cases were all lengthened and their

termination protracted, when we used cordials. Now grown bolder in their application, and disregarding the fear so natural of exciting inflammation, we determined on pushing these remedies farther than we had ever done, promoting by every accessory we could devise the return of the lost digestive action; and this we did by keeping the animal in the warm, covering him well with rugs, or these being deficient, with plenty of straw, and pouring into his stomach a warm aromatic tincture, made of the crushed or ground *pimento-berry*, steeped in proof spirit, left standing together for a week or more, and then strained off and kept in the cupboard of the stable for immediate use on the first indication of the disease; waiting about every three quarters of an hour between the exhibition of it. Rubbing the abdomen with the hand passed under the cloths, was also of salutary effect, as were occasional injections of warm water, in which a little soap had been dissolved, and small portions of warm water to dilute the collections in the intestines, but not so profusely given as to destroy the action of the tincture upon the stomach. Some of these cases would give way to a single exhibition of the tincture; others, more violent, would require a repetition of it. In our treatise on it is given a case of Lord Dundas's mare, related by my nephew, Charles Clark, which required seven hours before relief was obtained, and all hopes had nearly vanished.

We reject the epithet, *spasmodic colic*, to this complaint, as the spasms are not a necessary concomitant of this disorder, and the term *gripes* we adopt as being more simple, distinctive, and unmistakable.

At page 155, we find him recommending the strong use, to use his own expression, of the bearing rein, as it is called, which certainly with more truth might be termed the torturing rein; indeed the French, with more propriety, do call it the *fausse rein*, or false rein. Not only are the jaws grievously punished by it, but the windpipe and larynx also are sufferers from it, occasioning distortion, and occasionally ulceration; and this from a mistaken notion of the horse's neck forming an arch, which its anatomy and bones of the neck will show is not the case, it being nearly straight in its natural and proper position: the rising crest of a horse well fed is arched enough without keeping his head forced down and neck bent in this ridiculous manner.

He is found strongly recommending the administration of blue vitrol (sulphate of copper) for the cure of Glanders. We first proclaimed the beneficial properties of white vitrol (sulphate of zinc) in this complaint, and of farcy gleets also, but combined with cantharides and warm spices (See '*Pharmac. Equina.*') Now, this sulphate of copper, so vehemently recommended, appears merely an evasive copy of my recommendation, but without the beneficial adjuncts, and is therefore comparatively of little value.

He appears an advocate also for dividing the nerves of horse's legs; an operation almost formerly strongly recommended by the Veterinary College, but now nearly disused and disclaimed by the generality of well-informed veterinarians. When it is really done (for it is only pretended), we have seen the hoofs separate and fall off; for, deprived of their nerves, the arteries do not perform their offices, and the horses stump about in a miserable manner when thus deprived. Indeed, Wm. Moorcroft, who first tried it on the horse, very candidly condemned the practice. The lameness, indeed, caused by contraction and its consequences, can never be fully removed by thus further deteriorating the foot, where no part is given in vain.

Strongly recommended by the Row, this work has much circulated, among the lower orders more especially, of the profession. Indifferent books, however, have their uses, in that their errors being pointed out, serve as shoals and landmarks to be avoided by future navigators.

P. S.—Having taken a view of the Medical department of Youatt's book, we now add a few remarks on this performance in regard to the Shoeing of the horse, in order to prevent the mischief it is calculated to do in this respect, in as brief a way as we possibly can.

At page 37, in order to cover over the injury done to horses' feet by the shoeing, we are absurdly told by this man that it is *the pace* that is only to blame, and to use his own phrase, "*that kills.*" Now, the fact is, that the animal is fleet by nature, and no reasonable pace would hurt him if he had but the fair use of his feet, and this nonsense is confidently repeated by these men and scribblers, who endeavour to cover up the mysteries of farriery and the results of Shoeing, as it is called, but which has in reality but little or no analogy to common human Shoeing, to which it is constantly being paralleled. It is, indeed, but a clumsy endeavour to mislead, cloak, and conceal the real truth; rendered a cripple, his pace, indeed, becomes a most distressful suffering to him. And his burthens, monstrous as they often are, if good feet were allowed him, would not give him so very much concern. What must be the fortitude of an animal marching with heavy burthens, and his feet, as is often the case, reduced by ironing to two thirds their natural dimensions! and hardened with bone where no bone should exist. His sufferings must, indeed be such, under this double infliction, as no tongue can describe, but our author says slacken his pace only, and all the evil is done away.

The mischief, indeed, of this volume, if unexposed, must be very extensive, as his remarks show an extraordinary ignorance of the subject of the foot, and its shoeing, as it is called, especially its structure and physiology. At page 318, he orders "as extensive a bearing as possible of the shoe on the frog," thus reviving the old miserable folly of Lafosse and his frog-pressure system, long since fully exposed, and admitted by all the intelligent in these matters. He never, I believe, was master of a forge in his life, yet undertakes with the confidence usual of blind ignorance, to direct its proceedings in all respects.

At page 312, he directs equal pressure of the shoe "*on the bar and the crust,*" as he calls it, which he says is the best preventive against *corn* "and a powerful obstacle to contraction," and so thought Coleman. Now we certainly know nothing about this subject of the foot at all, if the Bar, or more properly the Inflexion, will bear any pressure at all of the shoe, much less the pressure on both, and which is the readiest way of bruising the foot, and producing a corn, as he calls it. In proof of this, we may produce a lamentable actual fact within our own experience. At Bristol, I established a forge, aided by the gentlemen there the most concerned and intelligent in horses. During my absence in town, word was sent me that the new forge at Bristol was suddenly going wrong, and all the horses becoming lame. I immediately posted off to see what was the matter, having left it in a prosperous state. On a searching inquiry, I found that one Hart, who had been left to superintend the forge, had become apprised and enamoured of Professor Coleman's *clip-bar shoe* that was to keep, by pressure against the bar, the heel open, as they called it, and this workman having faith in the doctrine, actually had applied this abominable pressure to the bar, and rendered all the horses lame, and on removing this silly trick, the horses took to going all well again; but alas! its effect was such upon the reputation of the forge, that it never fairly and fully recovered from it.

We had, indeed, by actual experience, learnt this fact respecting the bar or inflexion long before, and the cause of which may be seen explained in my description of these parts on the anatomy of the foot, without urging a repetition of it here.

In the next paragraph, he orders nine nails to the shoe, which would have better answered his purpose with seven, and these placed so as to give a degree of expanding liberty to the foot

by leaving one side nearly devoid of nails, as seen in our *unilateral shoe*, plate 6; also here is seen the nonsense repeated of the frog being a wedge to force the heels open, instead of passively obeying their impulses. At page 314, is a recommendation for a direful delabrement or paring away of the foot, and fears of the smith not sufficiently complying with it, and to follow which cutting, he adds the application of the red-hot shoe!

What is said in this volume about make and shape, on which it is easy for fancy to dwell, can be productive of not much harm, as it is the common cant of the stable, but when he attributes the blundering and stumbling of the horses to it, concealing the real cause of it in their feet, it is not so venial an offence, as it is leading the untaught and unsuspecting egregiously away from the truth.

It is also a lamentable thing that men daily enter forges to shoe horses without any questions asked as to their previous instruction therein, and who do such deeds of mischief as people in a general way little apprehend. We believe it would be greatly to the advantage of the public, and to the wellbeing of these invaluable slaves, to have constructed easy schools for grounding men in the primary elements of this art, a barn or empty building being all that is wanted for such a purpose, with an intelligent supervisor; for these artificers, unaware of their situation, and highly conceited, the usual result of ignorance, they are provided with a protection, by some evasive cant of their own. The most usual is, that it is the masters or the groom will have it done; in such case I have asked them if it is not shameful that they know their own business so imperfectly as to require the aid of the groom, whose business it is to clean the horses and keep his stable in order, to direct them in the shoeing also, which it is not in his range of business to know anything about.

As a sample of what is daily taking place in these matters of horses, I might illustrate it by a familiar example, taken from an actual occurrence in my own practice, and which will be of use to thousands entering the horse-market. A gentleman of my intimate acquaintance, T. J., engaged in the drug trade, was desirous of purchasing a horse for his journeys to obtain orders for his various articles. A horse was looked at, approved, and purchased, and a few weeks after he set off on his travels, with the horse much to his mind; he had not proceeded a couple of hundred miles on his road, when a cunning ostler found out that his horse wanted shoeing, which could not have been the case, as he had been recently shod before the commencement of his journey, and further to encourage him to the performance, he added that he knew a very clever fellow in the neighbourhood who would undertake it; together they went, and no doubt had the usual refreshment on such occasions. Business ended, he remounts his horse to proceed on his journey, but had not proceeded far, before he found his horse continually blundering and stumbling, so that he became highly dangerous, and no measures seemed to avail to correct the tendency, and on he went in perfect misery and so dangerous and disagreeable, that as he himself told me some time afterwards, he fairly was provoked to tears, as he went along, with vexation, and here ended his tale to me, whose aid he never sought afterwards; no doubt attributing these results to the horse himself, and my recommendation, instead of the tight buckling on and nailing up of the foot, after a woeful share, probably, of paring away the horn, and slashing away the horn of the frog or furch; exhibiting, as he thought, his cleverness by such assiduities, the foot becoming benumbed from compression and want of liberty and freedom occasioned his troubles. Now, these are the cases occurring daily and hourly, and of which no account can be given or understood by the unfortunate traveller himself till people absolutely get frightened at the thoughts of using a horse. What he did with his horse afterwards, I never

knew, as I never was consulted again. This incident I mention as one of many, to show to young aspirants to this profession, "what they will be liable to."

In order to cover the injury done to horses by the shoeing, we are absurdly told by this man and many of his associates, "that it is the *pace*" that is to blame, or which, to use their own expression, which "*kills*," although the horse is a fleet animal, and is not injured by any pace if only one condition be observed, and that is the full use of his feet. This ridiculous nonsense is continually broached by these mercenaries to cover over and protect these mistaken men in their practices with the feet, and for whose instruction, at the present time, there is no adequate School.

We believe that it would be greatly conducive to the well-being of the horses, and the advantage and profit of the public, to have a portion of the ample bounds of the *Veterinary College* appropriated for a School to teach countrymen and others, about to enter on the business of shoeing the horse, the real structure and functions of all the parts of the foot, in order to give them a real and just insight into what so eminently is related to their art. It would, I am convinced, be a saving of very many calamities and sources of inexpressible misery. And in country towns should also be instituted similar Schools, for this very important purpose, in regard to the use of this ablest, most serviceable, and most abused animal of the whole creation. And is it not disgraceful to the trade of Paternoster Row to recommend, and push vehemently, such mischievous stuff as this volume of Youatt's to a confiding public. Nor was he, indeed, a Veterinarian at all, or legalized by the College, such as it was, under mistaken instruction, but I have understood he had previously followed the preaching line.

Indeed it is a monstrous error that this noble creature in his care and management should not have in those looking after him some kind of previous education fitting them for such employ; but instead, any, however uninformed and ignorant, is turned into the stable to do its duties, which he is left to find out as he may, and many an error will he probably commit, before he arrives at a competent knowledge of the due performance of his office. Such is required, not only for the sake of the worthy animals themselves, but for the advantage of the property and welfare of the public themselves by a stricter investigation than it has ever hitherto had. For these men, encouraged by ignorance, which is ever conceited, not only rule the stable, but also rule the more thorny path of the shoeing and treatment of the feet, ordering the smiths, or threatening them with removing their master's business from their shop. And, so far as these things carried, that ignorance and brutality is thought often a recommendation in the knowledge of horses, and most lamentable results are occasioned by it, as I have witnessed in a very long period devoted to a consideration of those most beneficial and obedient creatures; such abuses, indeed, as those possessing horses little dream of, or know the bottom of.

Having with my hand led the first horse into the Veterinary College that ever entered it, and having taken up my abode for two years and upwards in the College, I narrowly watched their proceedings, till Coleman, finding me a rather troublesome guest, warned me off with this expression, "Mr. Clark, either you or I must quit the College."* I now with painful feelings

* And well would it have been had he executed his threat, being pushed into the situation by his friends, without any previous education to qualify him for such an office; indeed, horses were so little regarded by him, that I believe he never was seen on horseback in his life. In this state he lay open for easy delusion to any plausible theory that related to the art, and was caught by the Frog-pressure doctrine of old Lafosse, long since tried and discarded by the French, and so lost and enamoured was he with this nonsense that he took three patents in support of the system, and the mischief he did in this respect is incalculable, misleading all the young men who came for instruction to the College during 20 or 30 years; leading them into a practice wholly subversive of the functions

acknowledge, that of three professors who have undertaken the task of affording this kind of knowledge, not one is followed at this day by the public. St. Bel, from France, with his plano-concave shoe, is wholly disused; and as to Coleman, enamoured with the absurd doctrine of frog-pressure, all his schemes, his principle being utterly false, is nowhere adopted; and as to the third, Prof. Sewel to wit, no one knows his doctrine, but if one may judge by samples we have seen from his forge, it was of the basest kind, nor did he appear very much to trouble his head about the shoeing;* but all these gave out their dogmas as invincible truths with unbounded confidence, and received recompense accordingly. Now, the liberty and freedom of the parts of the foot necessary as a first principle in its office, and without which he can never go well or possess his feet uninjured, essential principle as it was, was wholly unknown to these men, and which is now become the foundation principle in all intelligent shoeing, so sadly have the horses been understood. And numbers of these young men so educated, not much employed by the public, took to other pursuits; and not a few, being wholly deserted by the public, I am sorry to say, miserably destroyed themselves; and much of this desertion springing from erroneous principles instilled in their education. But let us hope in the future, if not too much blinded and carried away by unworthy prejudices, that we may expect and hope for better things and more kindly and encouraging results, students remembering that it is to their own injury as well as the injury of those against whom such practices may be entertained.

Neither did they seem to properly understand the great advantages of a wide-bearing surface on the ground, called by them *coter*, as though merely for protection; and especially to be discommended their clumsy, thick, narrow hind shoes, for the same principles pervade both hind and fore feet, though a spread or broad-bearing surface is more demanded and given to the fore feet, as receiving at times a greater share of weight, and being by nature more elastic. These remarks are more directly addressed, however, to the lower order of shoeing smiths.

of the foot, and a speedy rejection of their measures and practices, and leading to their failure and disrepute, and distressing and punishing all the horses, and injuring them most seriously, and though always failing in his patents, although fairly pointed out to him, he persisted in it to the day of his death.

* As may be seen by a testimony of Henry Hunt, M. P., p. 14, addressed to Charles Clark, inserted among very numerous testimonials of disinterested intelligent persons in favour of the steel tablet, and unilateral expansion shoes, with perfect success and satisfaction, seen at the end of the treatise on the Steel Tablet Expansion Shoe.

SUPPLEMENT.—So little do I read their labours in *The Veterinarian*, that I did not know anything had ever been written against the very simple and necessary doctrine of the Elasticity of the Horse's, and, indeed, all other feet, nor till I saw it in a French Translation, where all this nonsense is copied, and this by Professor Bouley. To those who have any doubt of this doctrine of expansion, natural to the foot of the horse, the following experiment may be of use: the late Lord Morton, an excellent horseman, one day being in my yard talking with me on this subject, I told him I would give him a visible demonstration of the truth of the enlargement of the foot under exertion or pressure; I then ordered my own mare to be brought forth from the stable, and I put in the hands of his Lordship a pair of calliper compasses, and desired him with accuracy to take the dimensions of the foot, about the middle region of her hoof, and to fix them by the usually accompanying screw. This done, I then brought the mare to a flat stone I always kept in the paving of the yard for all experiments on shoeing. I now set her foot on this stone, and took up her other fore foot and held it from the ground, thus throwing her whole weight of these fore parts on the above single foot. I then told him to try to pass the foot with his callipers, but he could not; well, I then threw my arms round the neck of the mare, and suspended myself with my whole weight added, when the expansion became such as to be actually visible, and the compasses could in no respect pass the hoof. I never afterwards heard his Lordship show any doubt about the matter. Of what use, indeed, would have been an highly elastic furch, or frog as they call it, if this elasticity had not been the object or purport of it?

HIPPODONOMIA AND PODOPHITHORA.

SECOND NOTICE.

In our former notice, of this very meritorious, but singularly unappreciated work, we considered, chiefly, the contents of the first part, viz., Hippodonomia, or the true structure, laws, and economy of the horse's foot, leaving the examination of the second part for a future notice. Podophthora, a word compounded of two Greek words, *pous* *podos*, a foot, and *phthora*, corruption, signifies, as Mr. Clark has used the phrase, when applying it to the treatise before us, the "Demonstration of a pernicious defect in the principle of the common shoe."

In the first part of the work, the construction of the horse-hoof was very clearly explained. In this, the second part, the author sets out by shewing the absurdity of the idea prevalent amongst the overwhelming majority of horse-owners, horse-breeders, jockeys, smiths, &c., that it is more a measure of protection, than otherwise, to shoe the animal early, and that the removal of the shoe would be a piece of inhumanity, depriving the foot of a necessary means of protection. He considers—though it may appear a singular assertion that it is, for the most part, in consequence of defective shoeing we so frequently see the best saddle-horses put under vehicles for draught, and brought to the slaughter-house before the half of their natural term of life is gone through; he reprehends the plate shoe for racing purposes also; and, very properly censures the habit of indulging in stable cant and jockey phrases, that convey no knowledge of the matter to be considered.

As one of the best proofs of the injurious effects of shoeing, he states, that the young mare, of five years old, which had been shod, for the first time, on reaching that age, was carefully shod for the twelvemonth succeeding, and that, on being re-measured, it was found, that the foot, across its widest part, viz., at its greatest swell of the quarters, which originally measured nearly five inches and a-half, in the second cast measured only four inches seven-eighths. The actual length of the foot was not materially changed, a circumstance which, he thinks, seems to confirm the conclusion, that the cause which produced these effects operated laterally, and, consequently, evinced its having been chiefly the effect of the nails blocked in the shoe.

The furch had, also, been wasted by compression; and the sole appeared somewhat more arched or cupped than formerly, but the degree of thickening it had undergone, as also the elasticity it had lost, could not be accurately ascertained in the living subject; but that, a defect however injurious to the foot, could be detected as the elastic parts by pressure or want of use, or both, had been condensed or absorbed; that, each year, there would be less of elastic matter to act upon; the hoof would be gradually brought more in approximation to the coffin-bone; and at length, a partial diminution of the bone itself would be the consequence.

And, further, he shows that, if the hoof be small, and closely embracing the foot, and the horn thin, or very hard as is the case, particularly, with blood-horses, and, if the shoe had been applied early in life, then the evil will be operating in its greatest severity, and at a very early age, the animal is made a cripple of. At five, and even at four years of age, Mr. Clark says, that he has frequently seen horses, from this cause, incapable of taking more than half steps, going in the greatest pain and misery, and being with difficulty kept on their legs.

Smiths are accustomed to resort to what is called "throwing open the heels," in some cases of lameness, from contraction; but the author seems to think that the operation intended to produce that result is ineffective, that it only gives an appearance of widening them, and does not render the animal any lasting service. The process we find described as follows:—"We may observe, that the wall of the horse's hoof, at its inflexure or posterior extremity, is projecting to a sharp solid edge, or angle of horn, which is turned inwards towards the frog; and, in the collapsed or contracted state of the foot, is compressing and almost cutting it. This sharp angle of horn is removed by a slice of the buttress; and, by a second cut, a piece is also removed from the base of the frog, leaving a deep, wide notch in these parts; and it is usual to see a deep incision made into the thick bulbous covering which the frog sends over the inflexural column at its upper part. After this, the sides and bottom of the reverted arch of the frog are most unmercifully sliced away, and without any just reason whatever, as we have before shewn in our account of these parts. Indeed, the hard horn of the bar might be better spared, as it is the encroaching part, than the soft and more necessary horn of the frog or furch.

Next, the sole is miserably shortened by the drawing-knife. The effect of all this cutting away is, that the foot is not actually wider than it was before, or likely by these measures, to become so; but a temporary release is obtained from the pressure of the encroaching horn, and a degree of elasticity, which is natural to the part, is once more communicated to the foot. This temporary resource, Mr. Clark argues, will, with most feet, be ultimately ruinous: as it does not at all extend to the cause of the evil, without which no permanent advantage can be expected. The horn, he says, being robbed of its harder exterior coat, and having its interior more succulent one exposed, quickly dries; and in drying, contracts and pinches, or compresses the parts beneath, or perhaps cracks, as is too frequently the case, between the hoof and the inflexure.

The frog also, from frequent cutting, dries and diminishes, and at last, separates from its connexion with the hoof; and wet and dirt being admitted to the quick, it swells and cankers, so that the poor animal is reduced to a state almost incurable, and in all probability, passes into the hands of persons who are inhuman enough to "work him up," with the view of getting their money out of him before he perishes. The flaying of the frog leads to "frush," which leads to canker; and, this setting in, nothing remains but the slaughter-house, where a long concatenation of errors is consummated by the premature destruction of the noblest animal in the service of man. It should ever be the object, he argues, of the skilful veterinarian to preserve the main frame of the hoof as entire as possible, as in it consists its strength to resist the mischief of closing; and, as the foot cannot, when nailed to the shoe, expand outwardly, it will the more the interior is weakened close interiorly, so that we cannot too forcibly inculcate the necessity of preserving these parts.

In our former notice we remarked, that Mr. Clark met with a good deal of opposition from the veterinarian profession, in Great Britain. The Lecturer of the Royal Veterinary College was one of his strongest opponents: and, on the occasion of one of his lectures, at which Mr. Charles Clark, a nephew of the author, was present, after having stated that the natural foot of the horse, on its ground surface, is of a circular form, he claimed the discovery of the alleged fact for his own, and accused Mr. Clark as guilty of plagiarism, by appropriating it for his. "I," he said, "had described it seven years before Mr. Bracy Clark, and, therefore, I think you will admit, in this instance, that I, and not Mr. Bracy Clark, am entitled to all the merit of the discovery."

In reply to this, Mr. Clark's nephew in a letter to *The Lancet*, replied—"It will scarcely be believed, (after admitting that Professor Coleman *did* commit the blunder of describing the foot as circular, that the whole of his statement is totally erroneous, both as to the plagiarism, and as to the fact. In the first place, as to the fact, the natural foot is not circular: secondly, Mr. Clark has never described it as such, and, so far from entering into any competition with the Professor's circular foot above alluded to, has taken the greatest pains to point out its important deviations from that figure, and to develop the physiological causes and reasons of its variation from that form, and the practical advantages resulting therefrom to the animal." Of such a character were many others of the objections and misrepresentations of Mr. Clark's views by the worthy professor.

As to the remedial measures to be adopted for the removal of the injuries the foot may have suffered, the great object to be borne in mind is, that the foot shall not be cramped, by nailing the hoof down to an immovable iron ring. Mr. Clark early turned his attention to the formation of shoes that would not have the effect of compression, and, in the course of a few years' experiments, he tried no fewer than forty different descriptions of shoes, some of which were attended with eminent success, as abundant testimonials exhibit.

The shoe which, after every research, he decided on adopting, is called the Steel Tablet Shoe, or Steel Tablet Expanding Shoe, from the plate of steel which occupies its front part, and forms its most essential character. This shoe consists of three pieces—one of steel, and two of iron—which meet nearly on the upper surface of the steel piece, and are strongly fastened to it by two stout rivets, deeply received into a counter-sink, and which impart a power of motion to these lateral pieces. The width of the steel piece, or tablet, is so considerable as to afford ample room for the rivets and their heads, and protection to the joint, and nearly occupies the whole line of wear, which is principally outside the toe (as any one may perceive by examining an old worn-out shoe); and this steel tablet, being hardened to the spring temper, from its thickness and extent, confers upon it a durability unknown to any former shoe, and vastly surpassing the one in common use. The shoe so invented by Mr. Clark is now being applied by him, and has been attended with signal success.

In cases of ring bone and offrush, it is found to be a sovereign remedy, imparting almost without the aid of medicine, that liberty and freedom from restraint to the frog which takes away its fretted, feverish state, and which the compression of the common shoe always induces, more or less. The testimonies of the valuable character of this expansion shoe are most numerous and satisfactory, and Mr. Clark appears, by the invention, to have conferred an important boon on the community. The work which we have hurriedly noticed may, we trust, now come into more general use; but we would be glad to hear that Mr. Clark had published a cheap abstract, so as to put it within the reach of the general public, and thus promote the great object he has in view, namely, the cause of humanity. It is unquestionably the ablest essay on the subject ever published, and has been translated into both French and German languages.



THE HORSE'S FOOT AND THE HORSE'S SHOE.

* * On second thoughts, we have been induced to pursue the handsomely bound quarto before us, and chiefly because, being illustrated with anatomical engravings, we came to the conclusion that the subject might not be beyond our depth, and we are verily persuaded that no matter of practical import ought to have higher claims upon public attention than that concerning which Mr. Clark dissertates, because the greater part of his long life seems to have been occupied in exposing the martyrdom to which the noblest of the animal creation has been subjected for centuries. In one word Mr. Bracy Clark wages philosophic war against the old fashioned horse-shoe. He does so because the practice of driving nails through an inflexible iron ring into the horse's foot is slow, but certain ruin to the horse itself; and as this practice has gone on unquestioned for many generations, he is required to prove his position by anatomical considerations, and that proof we are bound to say, is altogether positive and inflexible. No one can read what he has written on the subject without being convinced and converted. He may have all the horse doctors in Christendom inflamed against the theory he lays down, but an array of facts is presented which never can be overcome.

And in the first place, this subject is of great importance, because it affords the last proof we have seen of the manner in which genius and industry are despised in our own country. As John Wesley would say, Mr. Clark has "raised up a nest of hornets" against him. Veterinary surgeons, whose name is legion, have traduced his intelligence; and veterinary colleges whose practice is orthodox, have specially cried him down. Men do not like to have all their cherished convictions upset, and doctors are not in the habit of patronising discoveries that would ruin their own trade. Because of such selfish tendencies in human nature, Mr. Clark has only been expounding the plainest principles of nature in order to multiply his enemies. And it might have been a sufficient answer to all the calumny heaped upon him for the public to have known that he has been a practical veterinary for many years, and has been honoured with the fellowship of some of the most enlightened societies in the world; but the public are slow to appreciate native worth, so long as the Pharisees and the Scribes have not believed.

In the second place, the study of the foot of the horse, with a view to protect it from decay, is a vital question, to which the history of human casualty sufficiently testifies. It will be found that nearly every accident to gentlemen on horseback has arisen from the mutilation of the foot of the horse in the smithy, and to number the instances of great statesmen and men of eminence whose service have by this means been lost to society would require a great amount of space. As far as England is concerned, the list would begin with William the Conqueror and come down to Sir Robert Peel; and in traversing through the record of the various men who have thus perished through veterinary ignorance.

The process by which the plainest conclusions are reached is a slow and elaborate one. Mr. Bracy Clark, as we have intimated, has taken years to discover a remedy for the common plan of shoeing the horse, and it is interesting to watch the process by which the evil and the remedy gradually dawned upon his mind. He reveals that process at great length and with such details that we cannot, in this place, describe his search after the truth. We may mention that part of his case, however, which is the most expressive and intelligible, namely, the exhibition, to the naked eye, of the foot of the horse as seen in a state of nature, and the same foot after it has undergone that mutilation which every farrier in the United Kingdom produces. This contrast is exhibited by pictorial illustration; and assuming the pictures to be correct, every one can, at a single glance, decide as to the reason why, as Mr. Clark tells us, "not one horse in thirty lives to see half of its natural life expended." "Why," asks he in continuation, "are rending bits and cruel irons, whips and spurs needed for an animal, that, in a general way, would be led by the smallest cord when in health and free from pain?" The answer will again be found in the pictorial illustration of the mutilated foot which Mr. Clark supplies, and if any one doubts the faithfulness of the engraving, let him judge for himself by a visit to any stable in the realm. But how shall we be able to make the contrast? Where is the horse whose foot has been allowed to reach maturity without mutilation? Almost nowhere; yet Mr. Clark was able to find such a foot, and that foot, which he illustrates, was the foundation of all his discoveries. It will be interesting to extract his own description:—

COMMENCEMENT OF THE EXPERIMENT.

A young blood mare of great beauty, and turned off five years old, was brought to my shoeing forge in Giltspur-street, from Weymouth-mews, to be shod. It had been bred by George Holston, Esq., and was permitted to run wild and unsod till her fifth year, so that her strength and growth should be, as much as possible, completed before she was brought into use. The opportunity, so extraordinarily afforded me of making the experiment, was not to be lost. A second, I thought might not occur; and such another has, in reality, never occurred to this day. Timid, and unused to have her feet modelled with, to get an impression in plaster was attended with some difficulty. The plaster of Paris was poured upon her foot held sole upwards; but before it could well set she grew uneasy at the position, and dashing her foot

to the ground, she broke it into a thousand pieces; and a second the same way. After this, as might be expected, she grew more impatient at being handled, and I almost despaired of succeeding. Being surrounded by many persons, I hoped to effect it better if she was led alone into the stable; and, giving her a feed of corn, in order to take off her attention, I placed the foot, unperceived by her, in a bowl containing plaster, wetted with warm water, that it might set the more quickly. After waiting a few minutes, and the plaster had become perfectly hard, I drew it away without much difficulty, and there was a complete impression of the foot in all its circumstances. This was done in the presence of my worthy and much-esteemed friend, Mr. John Biddle, of Birmingham, on the 13th June, 1804, who felt kindly interested in the successful issue of the attempt, and in the nature of the inquiry. After smearing this impression, or mould, with a little lard to prevent a crack, some fresh plaster was cast upon it, and I thus obtained the figure of the natural foot of the horse grown to maturity, and represented in Plate I. and it will be seen that for the beauty and symmetry of the parts, nature does not surpass it.

Mr. Clark also gives several engravings, illustrative of the various stages of mutilation by a false system of shoeing and these engravings demonstrate how gradually the power of the horse vanishes, destroying his usefulness, shortening his life, and endangering the existence of the rider. With the perfect example of that natural foot which he obtained in his forge, Mr. Clark entered upon an elaborate study of its various parts and uses, and the anatomical conclusions to which he came would be worthy of a volume in the next Bridgewater Treatise, or would form a companion to Paley's book on Natural Theology, as there scarcely appears to be in nature a more obvious version of design and adaptation than that which is here supplied by the horse's foot. One of the most important discoveries which Mr. Clark was able to make in this property of the horse is an elastic power, and is important to take notice of the fact because this elasticity is his chief argument against having an iron shoe fitted with huge nails and having no power of motion. Of elasticity in the feet, Mr. Clark says:—

THE ELASTIC POWER.

This is the inestimable property which guarantees the horse's foot from fatigue, which preserves it from jar, and the body from reaction and concussion, and all the injuries which a too solid resistance would have occasioned to both, and probably also assisting the animal in his advances by a return to its former figure after distension. This principle of elasticity in the foot of many animals, but particularly in the horse, has been overlooked, occasioning to this most worthy animal for a long time the grossest injustice, and the infliction of incalculable suffering and misery. The feet of quadrupeds are very differently constructed for meeting the ground and supporting their bodies. (Here follow illustrations from the foot of the squirrel, the dog, the cat, the ox, and the elephant.) The horse has this indispensable property, but in an inferior degree. We shall not be surprised at this if we reflect that with him is accomplished one of the most difficult problems in mechanics, that is to say, the moving of a large and heavy body with an extraordinary degree of velocity, and for this end a remarkable degree of solidity has been imparted to his foot by a hoof of one piece, in order that nothing of the momentum afforded by osseous and muscular machinery should be lost. And without doubt this solidity it was of the foot of the horse that has occasioned this elastic property to be long wholly overlooked, and has led smiths to treat it more as a senseless block of wood, without any motion, than as a living elastic organ most elaborately constructed for extraordinary performances.

After these explanations, the reader will be anxious to know what kind of shoe Mr. Clark would substitute for the shoe in common use. He says:—

These extracts taken from my former edition, serve to exhibit the state of my mind at the time of concluding that work about the year 1812. At that period, my views and attempts were considered quite visionary, and I often experienced the reproach of having discovered an evil for which there was no remedy. But what is still more singular, nine years elapsed with all the above facts before the public, without the least proposition from any one for the removal of the mischief, as though the case was hopeless. Having years before, seen how advantageous would be the disuse of nails, and conceiving that shoes might be attached without them, and be made removable at pleasure, I had long been occupied with that object, and afterwards, from beginning to see the full effects of nails, I redoubled my efforts, and sanguine in the success of it, secured my rights for a shoe of this kind by a patent; but after a long and tedious trial I abandoned it as being too troublesome for general use, though good advantages had been proved by its use on several occasions. I then fatigued and injured in my health, quitted these shoes and resolved upon the other principle, for there are but two, that is, to use nails, and to give a motion to the shoe itself.

In this Mr. Clark considers himself entirely successful, and there can be little doubt that a future, if not the present generation, will take advantage of his invention and discoveries. Meanwhile, he continues to spend the declining years of his life in the full faith that he has not laboured in vain, a faith in which every one must join who will take the trouble of investigating his researches.

The shoe he recommends is *The Steel Tablet expanding Shoe*, testimonies of the use of which are amply given but since then it has been found that leaving out nails on one side the shoe, gives a degree of liberty that enables the horse to step out more freely, and as it is a ready resource attended with no difficulty at all in the execution, multitudes of shoeing smiths have adopted it with evident satisfaction and advantage.



AN EXPOSURE
OF THE
CORRUPTION OF THE SAXON NAME

THE TRUE STRUCTURE AND ŒCONOMY OF
THE HORSES FOOT.

BY BRACY CLARK,

THE reader may smile at the singular character of the Treatise we here introduce to his notice, but if he happen to be the fortunate possessor of a horse, we will promise him entertainment and profit from its perusal. The absurd and cruel manner in which that invaluable quadruped is often maimed on one or more feet, by the clumsy and routine mode of shoeing is searchingly analyzed and exposed, and various improvements suggested in that process. from a careful study of the anatomy of the hoof and contiguous parts. As Horses are not endowed with the power of protestation against the injuries done them, they are fortunate in having found so able and ingenious an advocate as Mr. CLARK, and we are confident if they only knew their benefactor, their gratitude to him would be unbounded.

FROM THE EMPIRE 25th, MARCH, 1854

Lower Saxony, from whence came our worthy Saxon ancestors, bringing with them the German language and German customs of those days, and called by us Saxon, on account of those people inhabiting the Lower Saxony. Now their intention no doubt was, that all classes of the people should, in their respective ranks, enjoy an unmolested and fair share of the benefits of this life, whether poor or rich, or well or ill; an intention certainly worthy of their beneficent Creator, who would that these should extend to all; and which was but a very liberal, wide, and expanded view of benefiting every lot of mankind. Therefore these

to the ground, she broke it into a thousand pieces; and a second the same way. After this, as might be expected, she grew more impatient at being handled, and I almost despaired of succeeding. Being surrounded by many persons, I hoped to effect it better if she was led alone into the stable; and, giving her a load of corn, in order to take off her attention, I placed the foot, unperceived by her, in a bowl containing plaster, wetted with warm water, that it might set the more quickly. After waiting a few minutes, and the plaster had become perfectly hard, I drew it away without much difficulty, and there was a complete impression of the foot in all its circumstances. This was done in the presence of my worthy and much-esteemed friend, Mr. John Biddle, of Birmingham, on the 4th June, 1804, who felt kindly interested in the successful issue of the attempt, and in the nature of the inquiry. After smearing this impression, or mould, with a little lard to prevent adhesion, some fresh plaster was cast upon it, and I thus obtained the figure of the natural foot of the horse grown to maturity, and represented in Plate I, and it will be seen that for the beauty and symmetry of the parts, nature does not surpass it.

Mr. Clark also gives several engravings, illustrative of the various stages of mutilation by a false system of shoeing and these engravings demonstrate how gradually the power of the horse vanishes, destroying his usefulness, shortening his life, and endangering the existence of the rider. With the perfect example of that natural foot, which he obtained

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AN EXPOSURE
OF THE
CORRUPTION OF THE SAXON NAME
ARMS' HOUSEN INTO ALMS HOUSES;
AND OF
SOME OTHER NORMAN CORRUPTIONS.

By B. C.

VESTRYMAN OF MARY-LE-BONE.

BEFORE I hand to the honourable Vestry my small subscription towards the very desirable and commendable object the Vestry have in view, that of erecting tenements, principally for the decayed and infirm tradesmen, and others reduced to want, in this very extensive, opulent, and above all, reforming parish, I could much wish to hold up to their notice and attention a few plain remarks on the strange corruption of the ancient and proper name of these kind of houses, or tenements, from what they were formerly called by those who first instituted them, and to which I believe we shall do well again once more to recur; since corruption of names will but too often be the prelude to the corruption and abuse of the thing itself, as has been lately discovered to be the case in very numerous instances of our most useful and benevolent charities; therefore we propose it as one powerful means of guarding against the liability of such an occurrence, as well indeed as also with a view of maintaining our language itself in its original sense and purity.

There is every reason to believe these kind of houses were first instituted by our very liberal and noble-minded ancestors the Saxons, to whom we are also indebted for some of the noblest bulwarks of our liberties. Now they, in forming these establishments, for the best of all reasons called them *The Arms-Houses*, simply signifying that they were the houses of the poor,—*arm* and *arme* signifying in the Saxon language a poor man and a poor woman; and which very words still prevail at this day in and about Holstein and Lower Saxony, from whence came our worthy Saxon ancestors, bringing with them the German language and German customs of those days, and called by us Saxon, on account of those people inhabiting the Lower Saxony. Now their intention no doubt was, that all classes of the people should, in their respective ranks, enjoy an unmolested and fair share of the benefits of this life, whether poor or rich, or well or ill; an intention certainly worthy of their beneficent Creator, who would that these should extend to all; and which was but a very liberal, wide, and expanded view of benefiting every lot of mankind. Therefore these

anostentatious tenements were formed for the reception of such infirm or reduced tradesmen, or others of the better educated, who through misfortune, or imprudence even, or disease, or other mischance, might have become reduced from a better condition to poverty and want,—to separate such from the very low, uneducated, and vulgar poor of the work-house; a laudable enterprise certainly, and every way worthy of such a noble-minded and deeply-reflecting people as were the Saxons of those days. And whilst these tenements exhibited an extraordinary degree of neatness, and afforded every necessary comfort, and that barely afforded, they were upon such a reduced scale and system as to preclude, by their narrowness, their becoming the occupation of the rapacious and titled rich, whose own connexions and relatives could, or ought at least, ever be left to provide for such, and this without coming upon the industrious, and often hardly-earned stores of the middle classes.

I have been in Holstein myself more than once, and throughout Germany, and can speak with certitude of the poor bearing this name in that country at this day.

The additional *s* in *arms* may appear to some, unacquainted with the Saxon, not quite intelligible, but it is quite consistent with the common and familiar construction of our own English, which a few plain sentences will show, for it is indeed the simple usual sign of the genitive case. *Arm's houses* simply expresses *houses of the poor*, just as we say John's house, William's estate, Thomas's book, &c.; that is, the house of John, the estate of William, or the book of Thomas; and which *s* should not be mistaken, as it often is, for the sign of the possessive pronoun *his*, and which is frequently interpreted by writing, John his house, William his estate, and Thomas his book, which, as the thing can be made matter of possession, is an easy mistake to fall into; but if we put the *s* to the other sex, or to any abstract noun, then we shall see that possession has nothing to do with it, and that it is merely the sign of the genitive case, elegantly expressed by this brief addition;—for example, *the maiden's blush* is simply *the blush of the maiden*; *the maiden his blush* would make sheer nonsense: *the woman's rights*, interpreted *the woman his rights* would be absurd: and so of the abstract nouns, as *virtue's throne* is *the throne of virtue*, not *virtue his throne*, which would have no proper signification, &c. Thus then *Arms Housen* are simply *houses of the poor*, and, so used and considered and applied, will admit of no equivocation, misrepresentation, or corruption.

If I might be further allowed to trespass for only a minute or two on the valuable time of the Vestry, I would endeavour to throw some light on what appears to have been the way in which these houses became corrupted into *Alms Houses*, a pretty sort of phrase certainly, but which appears to have no meaning or application, when applied to them, whatever.

This corruption, like too many others, appears to have begun about the time of the Norman conquest, which despotically much extended hierarchical power and establishments, perhaps for one reason, that of securing more firmly the new dynasty in the kingdom, and was attended with the curtailment of many of our liberties, and with increasing vastly the usurpations of the clergy in various ways. In these days came also the formation of a great part of those hierarchical club-houses, called Priories, Abbeys, Convents, Nun-

neries, and of “ Fryers black, white, and gray, with all their trumpery,” and a numerous host of begging Eremites, under the pretence of religion, but of really little else than to leech and plunder the country, subverting the simplicity of the Christian religion, and turning it from an inward conversion and feeling to an outward accumulation of wealth and power.

Now William in ascending the throne of these kingdoms, being a Frenchman, old French or Norman French became the language of the court, and a corrupt sort of Latin the language of the law; and as there was ever existing in the world but too great a relish for following the language and practices of the court, so did the English, especially the clergy and upper classes, fall into the use of this new language, considering its adoption more agreeable to those in high places, and as being more polished, though in most cases quite otherwise: it was indeed the high road to honour and to preferment, and therefore was seduction sufficient.

Now it so happened, that in the Norman French the word *arm* or *armes*, *les armes*, did not signify poor, but quite a different thing, viz. weapons of war; and the battle-axe, the shield, and the bow, were the arms of these people; and the Saxon *weaponrie*, or those appointed to carry the weapons of war, became changed into the *soldat*, or *soldier*, from *solde*, pay, and this originally, perhaps, from *sol*, or *sous*, the actual coin they received for fighting; hence perhaps our old spelling of it, *souldier*. A confusion therefore, it was likely, would arise of the old Saxon term *arms*, and the new French term *armes*, both pronounced in every respect alike; and after years of this state of things, the French, as being more fashionable, gained the ascendancy, and the Saxon word becoming almost unintelligible when applied to these institutions, at last was supplanted by its more fortunate rival. This was also rendered more easy by the education in Latin becoming so general, where the same term was found signifying the same thing as in the French, till at last quite lost, the name given by these begging fraternities supplied its place, but which has in reality nothing to do with them; and which, in these more enlightened days of inquiry after truth, ought to be supplanted, and the real, original, and proper superscription be placed in its room. We usually in English writing put an apostrophe or comma when we use the *s* in the genitive case, signifying that an *e* is omitted, which formerly in the Saxon was expressed, and is at this day in a general way inserted in the German.

The idea of pious gifts to the poor, which attached to this word *alms*, was of too fascinating a nature to be resisted in a country prone to religious feeling, and was especially applied by that class who found the immense profit of fostering such propensities.

We will now take a view of the probable source and origin of this word *alms*, in order to show its perfect irrelevancy to the case, and of showing the impropriety of its adoption for the superscription of these poor-houses.

It is generally understood, I believe, by historians, that about the time of one of William's successors, viz. Henry II., the greater part of all the abbeyes, priories, and so forth, were built; and these sorts of trading communities pretending to barter the gifts of Christ and of Heaven against the estates of credulous men and their wealthier gold, a most

profitable concern was made of it, by which at last, as historians record, more than half of the kingdom was bartered into the hands of these administrators of heavenly gifts.

Some of these fraternities were by profession, or as being appointed by the others, beggars, and begged from door to door wherever anything was to be got. These pious mendicants, there is little doubt, had also their formula or watch-word for their solicitations on these occasions, and which, there is little doubt, consisted of the two soft, sweet, and persuasive words, viz. *alma mater*, giving to them a meaning and interpretation they could hardly bear, viz. *holy mother*,—intending thereby to designate the blessed Virgin, the mother of our Saviour and holy Lord; well knowing that if they had used his name, the Saviour's, it would have been a striking fact to every one, that they were doing that which he had strictly forbidden, to receive more than their necessary wants required; but in whose name, if begging was allowable, they ought really to have begged, as it was his cause, rather than hers; but this would have been too plain and have disclosed the cheat, since he said to his own followers, "Freely ye have received, and freely give."

So there is no doubt they found in their whining in this way a more plentiful harvest than they could have reaped by the other mode; nor did they desist from these measures till, as we have already said, immense treasures had been accumulated, treasures not of heaven, but of this wicked world, much of which was received for pretended remission of sins also; which, as they had not the power to do, as is now universally admitted among the reformed, was directly obtaining money under false pretences; and can any, therefore, deny the right of the public to it again?—but which now they hug closely, defending it with the delightful name of *vested rights*, although the law and common sense say whatever is obtained under false pretences can establish no legal claim; and the whole was a deception and fraud. And then as to the other two very enticing and fascinating words in their commencing oration, viz. *alma mater*, such do not really signify holy mother, as they would have them believe; for though she was a truly holy woman, and the greatest among her sex, yet the word holy is nowhere applied to her in the Scriptures, and our Saviour, even for himself, refused the application of the term. I had long apprehended these words might possibly be found somewhere in the Latin Testament, applied by the Catholic translation, but on search I do not find any such; they must therefore have been the expression of some of the early writers of the Christian church, or were entirely the invention of the monks themselves. Their simple signification and meaning was, probably however, and also by whoever first used them, not holy mother, but simply the nursing or feeding mother of our holy Saviour, being derived from the Latin verb, *alo, alere, alitum*, to feed, precisely in the sense of our own vernacular word *aliment*, meaning nourishment, and by propriety should have had no other interpretation: but this explanation would have been too simple for their purposes.

Now these words were flowing and agreeable to the ear, and far from unpleasant, which no doubt contributed to their magic effect in bringing in money, so that they proved a talisman for almost boundless riches, enough to have corrupted any church in the world, even of the most virtuous,—though the acts of these sufficiently show they were not such.

It is but reasonable to suppose, that by their cupidity and unceasing importunities, and by the continual repetition of these fascinating words ever in their mouths, that in process of time they became nauseous and tiresome to the public, however pious and well-disposed they might be ; so that on the approach of one of these mercenary beggars to the door, they would be likely in derision to say, Here comes the *alma-mater* man ; next, Here comes the *alma* man ; and next, Here comes the *alms* man ; and at length any small pious gift was expressed by a giving of *almas* or *alms*.

Now we revert again to the Norman language, which, as the king of Normandy had usurped the place of the Saxon king, so the language also usurped in very many cases the place of the Saxon, creating often considerable confusion, and particularly so in the present instance, fostered no doubt by those who could gain by it and turn it to some account, having ever a strong voice at court, and an eye for taking advantage of the absent.

Now the old word *arms*, applied to these establishments, becoming every day more and more obsolete and unintelligible, was, there is every reason to believe, at last disused, and *alms*, being of somewhat similar sound, got foisted in and substituted in its place ; but which, as there is no begging going forward in these tenements, cannot, in any proper sense of the term, apply to them, since they are endowed fully for every intention from their beginning—not by alms, but by real benefactions and subscriptions of the charitable and well-disposed citizens and others : therefore, most uncouth and offensive ought to be a name carrying with it such an imputation. Indeed, the poor inmates must not be allowed to depend on such a precarious mode of support, or to use it by any means ; so I humbly submit, whether we ought not without delay to restore the very old, significant, simple, and proper English word, which whilst it is used, and by this explanation being fully understood, may defy the assaults of corruption. Indeed, do we not owe it as a respect due to the noble memory of the first inventors and founders of these institutions ?

I had some curiosity to see what our great lexicographer, Dr. Johnson, would say about the origin of this word *alms* ; and he first gives us a Saxon origin for it, but apparently not quite satisfied with it, afterwards a Greek one ; both of which we will now consider.

The first, or *elmes*, is no doubt an Old English word, but instead of its being the original of *alms*, we are fully of the mind that *alms* was the original of *elmes*, and that there is every reason to believe that *almas* was their first designation from the source we have mentioned ; and that this begot *alms* by the simple omission, for brevity, of the second almost superfluous *a*. Now any single gift was an *alms*, but as many of these were given, it became convenient to have a plural for the word, and as an *s* already occupied the end of the word, another could not be well added, euphoniously at least, to it ; and how did they proceed then ? By a change of the beginning, as we may see in the case of *old* and *auld*, made into *elder* and *elders* ; and hence, we believe, the true source of this *elmes*, for Johnson does not explain how the reverse could take place or was its source.

The German language is often a great help to us in illustrating the Saxon ; and there we find preserved the broad significant *a* in *alms*, a remarkable feature of it, and which they pluralize by *almozen*. The French again retain this important *a* in their word *aumes*, showing that the *a* in *alma* was pronounced at this period very broad, or nearly

as our *aw*; for there is little doubt the same practices of begging monks prevailed in nearly, or quite all, the European countries, and it is also as probable that the very same affecting piece of Latinity was furnished to them by their more artful leaders. I would ask any unprejudiced person whether the Latin does not come nearer to the word, than this supposed Saxon *elmes*, or the Greek we are going to examine.

As to the other word *eleēmosynē*, it is a sort of Latin not to be found in any dictionary of sound Latin, but is to be seen among the corruptions of Latin, much of which we appear to owe to ecclesiastic management; and why, if they really did so, should they resort to Greek, when there was plenty of Latin would have served their purpose? if they did, which we believe they did not, it could be only to mystify things, *et les embrouiller*. But how this word could be made into *alms* with its broad *a*, remains to be shown: such we believe by any natural process impracticable; and then if it did, what did it serve? this word simply signifying *misericordia*, pity, and nothing else—no giving or receiving; and it was not *pity* these mendicants wanted—they wanted the hard Spanish and nothing else: so that even in signification *alms* it could have had no purpose. In a dark age, however, an obscure and ambiguous language might work on the credulous better than a plain and straightforward one; so far Greek was best; but Latin, which they used abundantly even in mouths that understood it not, was plentifully supplied, the better to lead them into their wretched nets:—in this manner, as Milton beautifully has it, “And all the sacred mysteries of heaven, to their own vile advantages would turn.”

Now *ἔλεος*, *eleos*, also the root-word of *eleēmosynē*, had the very same meaning, viz. *misericordia*, and extended nothing beyond it—no giving, no receiving. And a starving Greek word for pity would have been a poor substitute for the tangible article. Nor does there appear to us an instance of an *e* being converted into a broad *a*, though the converse is often true. Therefore, till better evidence than Dr. Johnson has afforded, we shall continue of the mind we are of, respecting the origin of this singular word.

If I may appear to have spoken feelingly on these subjects, it is not without a cause, having often suffered the gripe of their more bold successors, who, furnishing themselves with law, (no difficult matter to do,) seize, not ask, our property towards maintaining their double empire of church and state.

These are days of sifting and inquiry, and of doing away delusions which have had their place but too long, and of establishing useful truths of high importance to mankind in their place, and the unmasking impositions of every kind, as well lay as clerical—of the royal king as of the abject subject—leading to great and high destinies in the future relations and conduct of mankind. Hereafter, therefore, let all ambiguous or misapplied terms, leading ever almost to abuses, be laid aside, and clear and plain language only be used; we could desire to see, therefore, *pious gifts* substituted for this absurd word *alms*, and *charitable gifts* or *liberal gifts* for such as are of a liberal character, and *bountiful* for *bountiful gifts*, and *penal* or *forfeitures* for such as are of this description,—that there might be no longer any confusion or ambiguous words or obscure twisting of meanings employed to serve private ends.

I can hardly avoid noticing in this place, another twist given to our language, inter-

estedly, by these beggars, or other classes of their fraternity, and that is, the corruption of the beautiful word in the Greek Testament, used particularly by St. Paul, ἀγάπη, *agapē*, signifying the kind forgiving of another's fault and not visiting it with the like return, thereby destroying the very root of all discord,—covering up indeed one another's faults, and washing of feet, as our Saviour called it, or typified it. Now this word the Romish church construed to mean charity, and charity, again, they screwed to mean the giving of money,—a thing, the apostle, in his use of the word, had not the least in view, or our Saviour in the washing of feet.

Our language, by the restoration of this ancient and most proper term, *arms*, applied to these houses, would be enriched thereby, and rendered more copious by the addition of a useful term, and we should be enabled to give some good account of what we meant by it; but not so if continued in its present state. I therefore hope, as our Vestry is among the noblest in the kingdom, not only by good deeds of reform, but by the vast wealth and income also that it has the disposal of, that such an example, if set by us, could hardly fail in time to be followed by the whole kingdom, and, in a very short time, would render it perfectly familiar to us again, as it was once before.

If the word *alms* must be continued in common language, let it be used only in the begging sense of pious gifts, or the giving of small pittances; but with such noble endowments as these, from liberal donations and subscriptions,—never let them be debased by such an application, for these houses are indeed not raised or continued by any such means.

If the worthy committee, managing the subscriptions for the erection of these houses, will please to accept from me five pounds, I will give it with good will; but if they will adopt the proper word, as given by our noble ancestors, I will double the sum; nor can any one of real taste, or any lover of sound Old English, but approve, I believe, of such a step.

If I might be further permitted a moment of indulgence, I would not conclude this inquiry without a remark or two as to the other word used for these tenements, I mean the word *housen*—*arms-housen*,—such being the strict and real terms applied by our worthy ancestors to them; for now appears to be the suitable moment for our making any improving change—in this day of reform, whilst it yet is permitted to last.

The term *housen*, I need hardly say, is the Old English or Saxon plural for *house*, or is synonymous to *houses* as we now have it; and the remarks we are about to make may, if attended to, I believe be instrumental in rendering our language more harmonious and more agreeable to the ear than it is at present; being often considered, and much objected to by foreigners, on account of that continual scissing or recurrence of *sis* in it, which is giving to it a sibilant character so strong, that it has been compared by some to the whistling of birds, and by others, less favourably inclined to us, to the hissing of serpents. So we had formerly also *hosen* as the plural of *hose*, and *peasen* of *pease*.

Now it is a circumstance to be admired at, that it is from those very objectors that we have obtained the cause of this superabundant scissing sound, from having changed our plurals in *n* to plurals in *s*, after the French and Normans; for they always put an *s* to

the plural, as *table* in the plural makes *tables*, *vin* makes *vins*, and so forth. Now they, by a certain careless and artificial way of pronouncing their words, leave out often nearly or quite half the letters comprising the word, and always leave out the *ses* in the plural of nouns, unless a vowel follow, by which they get rid of the scissing sound they accuse us of, whilst we, more honestly giving and pronouncing every letter, fall into it.

Now what I would propose, or at least suggest for consideration, is, whether we might not with advantage, in many cases at least, return again to our Saxon construction; for our language is, and ever must be, in its basis and construction, Saxon, and irrevocably and virtually so,—and in its being so I shall ever, for one, feel glory and a pride; for in flexibility and copiousness of its terms, I think it has the advantage of any European language. I therefore, without the least hesitation, would propose, that in this case, for one of many, we should throw out the redundant *sis*, and finish the plural with an *en*, and so destroy the violent whizzing and scissing which the word *houses* must ever carry with it; but after thus fairly stating it, I leave it entirely to be determined by the sense and feeling of better judges. Who, for instance, would hear of our changing the word *oxen* for *oxes*, or *man* into *mans*, instead of *men*, or *woman* to *womans* instead of *women*, or *children* into *childs*, or such like, where we see the Saxon plural preserved uncontaminate? *Armen*, is the Saxon plural for *arm*, also terminating in the more harmonious sounding *en*.

In further confirmation of the above remarks, I may also observe, that on any one travelling by chance or otherwise into the midland counties of England, as into Oxfordshire, Warwickshire, Worcestershire, and there, on espying some of these charitable dwellings, if he should inquire of some of the inhabitants, (especially if selecting for this purpose one that was rather advanced in years and also not much educated,) what he called these tenements,—his answer, as we well know from making the experiment, (at least it was so some forty years back,) would be “Why, they be *arms-housen*, to be sure.” Being a native of Oxfordshire myself, and of its rather remoter parts, I can testify and confirm this from frequent experience.

But then comes the pedagogue with his Latin and Greek, and perfectly innocent of the knowledge of Saxon, and not finding any clue in his vocabulary to the word *arm’s*, immediately declares it must positively mean *alms*; and so *alms* gets scribbled over the lintel of these simple, benevolent sanctuaries of the poor. And thus is confirmed for a long series of years an unsuspected corruption. I therefore hope and trust, on one or all of these accounts, we shall begin the reform by a renewal of the right, correct, and expressive language of this country.

Lines

Written whilst sitting on the Bed where B. C. was sleeping.

By J. W * * * * G.

Sweet boy, while o'er those sparkling eyes
The gentle slumbers fall,
That thy fair form refreshed may rise
On Nature's sportive call,

Reclining o'er thy peaceful bed
With all a brother's love,
O, may I ask upon thy head
A blessing from above!

Yet vainly why should I presume
To offer up the prayer—
That heaven would through the midnight gloom
Extend her guardian care?

For round such innocence as thine,
His all-pervading love
Must with peculiar favour shine,
And every ill remove.

Not vice's poisonous blasts, I trust,
Shall lay beneath his care
Those tender buddings in the dust,
Which promise now so fair.

And long unblemished may they blow,
And richer fragrance breathe;
And long around thy placid brow
May peace her olives wreath!

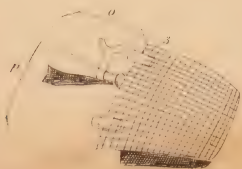
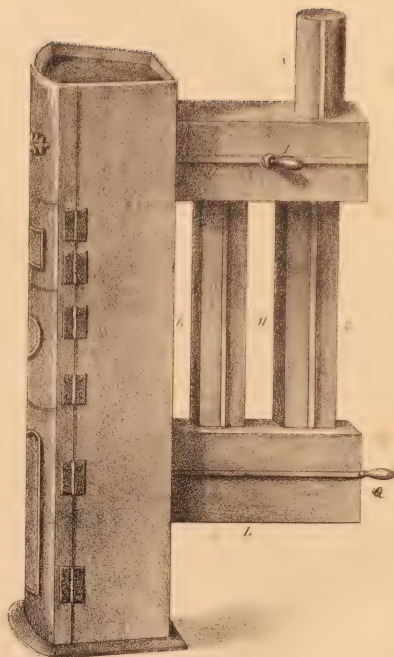
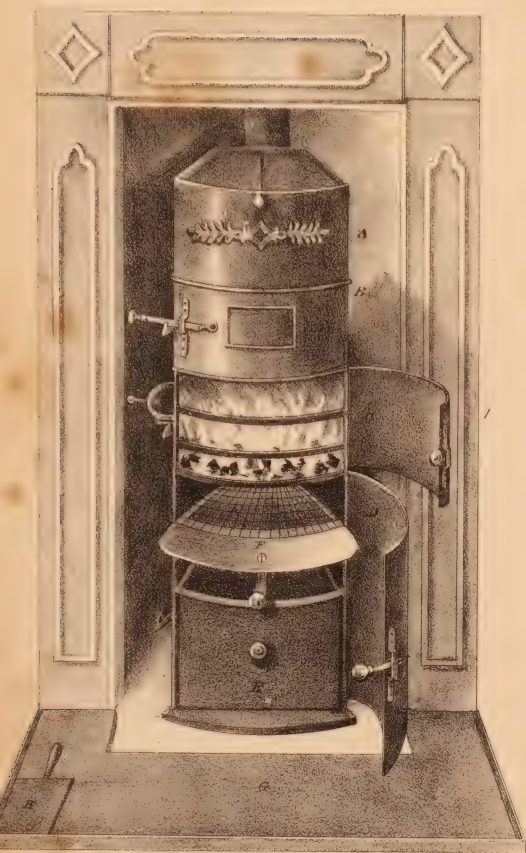
Though those loved features to behold,
Not long must be my joy;
Or mark thy mental charms unfold,
My sweet engaging boy;

Yet all those charms so dear to me
In Memory still shall live,
And fond affection still to thee
Her fervent wishes give.

J. W.*

* Written at Chipping Norton by Jeremiah Waring, of Alton, perhaps about the year 1774.





Description of an economical and useful Stove for Warming Rooms and other purposes, invented by Bracy Clark, F.L.S. and Member of the Royal Institute of France, &c.

HAVING early in life been much attached to the pursuits of chemistry, and for amusement as well as economy, been led very often to construct the necessary furnaces and stoves with my own hands, so in years since, being desirous of warming my study in the most effectual and economical way, I contrived one which, after more than a twenty years' use, finding it both pleasant, effectual, and beneficial, I am induced to make it, by giving figures of it, and a description of it, more fully known to the public. This stove or furnace combines in one all the essentials of an English fire-place, German stove, and air furnace, being changeable from one to the other at pleasure in a few moments. I have called it *The Megalifer*, or *Megacalifer Stove*, from the great heat it gives out, with a comparatively small portion of fuel, conceiving the most useful property of a stove to be that of yielding from a given quantity of fuel the greatest share of absolute heat and of radiance when required, and to have these properties under good controul as to their proper degree; and, at the same time, to be simple in its construction, and of comparatively little expense.

The fire in this machine can be wholly exposed as in a common English fireplace, or be half-exposed with a sharpened draft, or be wholly enclosed as in the German stove, and be kept out of view. Or, it can be made of the keen draft of an air furnace, which in the lighting of a fire quickly is a very great convenience. It admits also of boiling, roasting, or baking, in a small way; or for hastily warming water for shaving, or boiling an egg, &c. and this without soiling the tin vessels used, by the placing them in close contact with the stove on its outside, and opposite to the place of the fire, or on the fire itself for greater speed.

For a private gentleman's, or student's apartment, it will be found invaluable; or for a large poor family, where the consumption of fuel, and the making the most of it, is an object, as it will render a considerable sized room perfectly warm everywhere in the coldest day of winter. It is also a sure antidote and remedy to a smoky chimney, and it enables us also readily, and in a remarkable degree, to renew a fire immediately that is nearly gone out; and will burn well with very inferior coals, and is easily controuled.

I had a drawing of it made after a furnace I had had more than twenty years in use without its being near worn out, of which a lithographed copy is here given. And the following is a description of it.

In its general figure it is a tall square tower, Fig. 1, narrowing backwards, by which we obtain as much radiant heat as possible, farther increased by its bowing out in front. And by contracting it backwards, we not only diminish very much the consumption of fuel, but at the same time prevent the operation and effects of the fire upon the back parts of the stove.

The stove is made of common iron plate of moderate thickness, transmitting the heat readily to the air surrounding it, which air, as it cannot pass up the chimney, that being

closed, as we shall see more particularly hereafter, so it ascends into the room, and making for the ceiling, diffuses itself throughout.

The stove is contrived to stand in the recess of a common fireplace very commodiously, or only partially so, as may be thought best, and we now proceed to describe its provisions or parts. There are also certain pipes or tubes of metal behind the stove, which are almost concealed, and which contribute not a little to its effects, without being hardly visible, see Fig. 2.

The total height of the stove is about 2 feet 9 inches; and its rounded front exposure, in advance of a straight line in the middle of it, is about 2 inches, the actual width being 11. Its back line is only $7\frac{1}{2}$ inches; its side exhibits $7\frac{1}{2}$ also. Its compartments or divisions are as follow. Its general frame, I should first observe, is strengthened by a flat iron bar, going down its front edge, of $\frac{1}{4}$ in. wide and $\frac{1}{4}$ thick, and which receives also the bars of the fireplace.

The Top Chamber, A No. 1, confining and directing the smoke and flame, is of 6 inches depth, closed upwards by a well fitted plate of iron, which rests upon iron stays, and is sunk a full inch within its superior edge or margin, affording a light appearance to the stove, and a cavity useful for many purposes. This chamber in front is ornamented with a double feather of brass or iron gilt, which gives to it a more agreeable and elegant appearance.

B. No. 2, is the Suprafocal Chamber, receiving more immediately the flame and smoke from the fire, and is closed by a door $5\frac{1}{2}$ inches deep, and is provided with a latch handle for fastening it, and has an ornamental square of brass or iron on its front surface.

C. No. 3, is the Focal Chamber, or direct fireplace, the fire being supported on bars, resting on four stays bent at right angles; the bars in front retaining the fire, are narrow in thickness as $\frac{1}{4}$ in. but are $\frac{3}{4}$ in. wide, that by their substance or thickness may not absorb much heat or prevent radiance. The door is 6 inches deep.

Fourthly, we have D, the Infra-focal Chamber, which is much larger than the others, and contains below, E, the *Ash-Box*, with its handle for drawing it out by. This box, on occasion, can be made to serve the office of an oven, having a lid or plate of iron, which closes it at top, inserted in a fold or groove. In this case it can be introduced into the top of the stove, the plate which closes it being removed, it is only suited however for any small matter, for the roasting or baking of it.

Above the ash-box, and resting by its foot on a bar which divides this lower chamber into two nearly equal parts, is seen a wire sieve, the wires running transversely across it to a frame made of a stouter wire, either iron or brass, and which sieve lets nothing pass but ashes and the smallest cinders, and is a great convenience and economy in saving fuel, and in roasting potatoes, or other things, and occasionally, when it may be required to damp the force of the fire, in throwing on it the cinders so collected.

To this sieve is attached a tin plate, F, of about six inches width, and which is bent downwards, or concave a little, the better for receiving and collecting the ashes and cinders, which otherwise might litter the hearth, and directing them to the wire sieve, the outer or front extremity of it also sloping upwards. This slope upwards is maintained by a wedge, which is resting on the wooden handle attached to the sieve by loops of tin. Through the tin plate and wedge, and nearly through the handle, passes a screw, holding them all firmly together. If the screw passed quite through, we found by experience it burnt the fingers coming in contact

with it on handling this part in throwing the ashes or cinders on the fire, and the wedge was also contrived to prevent the hand coming into contact with the hot tin plate on these occasions.

To those who enjoy their pipe, this ash-box, being drawn out, becomes a convenient spittoon.

Fig. 3 exhibits the under surface of this sieve, and its attached plate, its fastenings and rising margins of tin to collect and retain the cinders from falling over; sufficiently plain, we apprehend, for any one to construct it by. And opposite letter O, is seen the iron stem or foot with its claw, by which it is supported in an elevated manner on the bar.

If it be desirable to close the stove entirely, we must first remove the tin plate and sieve and then we form a sort of German stove of it, and produce a slow consumption of the fuel, and any considerable escape of air from the apartment into the chimney.

The stove stands on a flat frame of iron, to which it is rivetted, of about the same thickness as the bars of the grate, having a projecting flange.

G, represents a broad iron plate, which defends the floor, and prevents any danger of ignition; exposing however, a good portion of the clean white hearthstone in front and sides of the stove, and gives it a lighter and more pleasing appearance than if the iron plate had covered the whole stone, as well as requiring less iron. Its margins are everywhere bent up at right angles, about an inch, to hinder the escape of any cinders or ashes. This plate in our stove is 2 feet 6 inches wide, and 2 feet from the jambs to its front turned-up edge.

In this same plate, letter H represents a small tray of plate iron, which fits exactly the left-hand corner of the plate or fender, and the front edge of this tray is let into or received within a slit or notch of the fender plate the edge being a little raised, and over which any dust, or ashes, or cinders, &c. are swept, and thus lodged, are easily removed by the handle throwing them on the fire, into the ash-box, or on the sieve.

Fig. 2 represents a lateral view of this stove, and exhibits an interesting part of the contrivance for increasing the heat communicated to the chamber, which is a distribution of iron pipes that stand in the recess of the chimney very commodiously, and almost unseen, and which can be brought into use or omitted at pleasure, the hot air of the fire being made to pass through them, or only a very short part of them, and this is instantly effected by the Valve I, whose handle is seen projecting from the side of the tube; turned horizontally, it allows free passage, and vertically obstructs any passage, without going first through the two perpendicular pipes, L, M, and so through the short pipe N into the chimney, which last short pipe is removable, being fitted on to a rising collar, beaten out of the upper surface of the horizontal pipe I, it is about a foot long, and we may just observe it is applied to the collar after the stove has been duly set and adjusted in its place in the recess of the fireplace.

The chimney is perfectly closed from any access of air (otherwise than through the apparatus) by an iron plate traversing it, the edges being turned down an inch at right angles, through which nails are passed into the wall, a perforation being previously made in it for pipe N.

We have found it highly convenient when the stove is to be removed for any purpose from its recess, to have a long nail inserted in the back wall, reaching nearly to the pipe N, and on which this tube is set whilst the stove is being withdrawn.

At Q is seen a trap-door, with its handle, for cleansing the pipes below, the upper parts being best reached through the doors of the stove and through the collar.

As cleanliness is also an object with a stove, as to the cinders and ashes falling about upon the hearth; and where we possess the great advantage of a fire-place bowing out and projecting circularly in front, by which exposure of the fuel we obtain a vast increase of its heat, we encounter also the difficulty of its dropping its ashes more extensively than in a perfectly flat grate, as this projection was a benefit of a description not to be given up, we palliated the inconvenience by the invention of a tin plate to receive such fallings; and sloping upwards, it turned the cinders and ashes on to the wire sieve, and saved any litter, more however than is inseparable from the burning of all fuel in open grates.

Farther, what ashes did happen to fall in putting on the fuel or in stirring the fire on the hearth stone, were easily brushed on to the iron plate extending over great part of the stone, and from this iron plate on to the little square tray at the left hand corner of it, they were, by its handle, easily taken up, and placed on the fire or in the coal or ash-box, so that it was, of all hearths I ever saw, the most easily kept clean. I need hardly repeat, the front edge of this small tray was received or buried in a rising slit in the plate, over which any ashes, &c., were easily passed, by the use of the hand-brush.

If the reader receives only half the pleasure and profit I have had in its use during many years, he will not have much reason to regret the adopting of it.

Useful properties and proper management of the Stove.

A FIRE of equal dimensions in this stove can be made to burn with more brightness, and consequently with more warmth and cheerfulness, than when placed in a common grate, and that even without the closing of either of the doors; but if we close the supra-focal door only, the briskness of the fire is very much augmented, more so than in any house stove. It will be said, that with this augmented brightness, the fuel is consumed faster, and such is the fact, but I maintain it as a truth, that with a moderate brightness, the warmth and radiance given out is in a greater degree than the increased consumption, compared with a low fire of little or no brightness or radiance.

The great perfection of any stove is to be completely under command, and to yield the greatest possible share of heat and light with a given quantity of fuel: some admire a slow smouldering stove, but we admire rather a very bright one, that can be made a smouldering stove at pleasure, whereas the smouldering stove cannot be made a very bright one.

A stove smaller than this, on this principle, if properly attended to, would be adequate to all the purposes of heating a room, but then it would be liable, if not frequently looked after, to going out, as with a very small mass of fuel, will always be the case. I find, to make a long enduring fire, it is well to heap the fuel at the side of the fire-place or grate, that is, when the fire has been well lighted,—the ignition, in crossing over to the cold mass, takes some time, and from the mass heaped together, is long in consuming, which, before it is too far consumed, we heap the fresh coals again on the opposite side, when a similar operation

of crossing over slowly takes place, for the fuel being attacked only on one side retards a too rapid ignition and consumption: in this way the fire was easily maintained, without much or very frequent attention; or the same may be done by heaping the coals on the back of the stove, drawing the fire previously to the front part; and in this way the difficulty is tolerably well removed. In all other respects, this stove has superior advantages, and the pipes behind are so contrived as to be no desightment at all to an apartment, which a straight pipe of the same length undoubtedly would be, with the advantage of using it or not, at pleasure.

In my early attempts with this stove, I proposed to add to its other properties, that of being a descending one, at will; that if any chop or steak was done over the fire, the smoke from the burning fat might be carried downwards through the hot coals and be burnt, instead of mounting upwards in the room or chimney, this I also effected, but abandoned it afterwards, from finding that this operation was liable to uncertainty, for if the mass of fuel was at all in a thick or dense stratum on the grate, the descent of the smoke was precarious, too much so indeed to be trusted, and a very thin stratum of fuel was always liable to go out.

The Arnott Stove is much employed at present, but the vast mass of dried clay or brickwork the fire has to penetrate through to get the heat to the exterior of the stove, and then only in a weak state or degree, is a great waste of fuel and loss of time, especially where a speedy effect is wanting to be produced, as in a cold day, the thin metal in the present stove is so soon penetrated through, that it is almost as though the naked fire was presented to the air of the room, which in very cold weather is a great advantage, and in warmer weather the lowest degree of combustion, which a mixture of cinders, ashes, and fuel, and an open stove unclosed can produce, is sufficient, and in that case also, the valve being set open, the flues or pipes are put *hors de procès*. And if a dull heat be required, the whole stove can be muffled up by closing all the doors.

In early attempts with this stove, the supra-focal door for feeding the fire was half as high again, and the flue or smoke chamber consequently as much diminished or reduced; the consequence was, that whenever the door was opened, and the weather unfriendly, and the draft not very keen, it often smoked, but after I reduced the door, and augmented the depth of this chamber, it never was seen to smoke in the least, not even under the most unfavourable circumstances.

O represents more in detail the figure of the tin plate for receiving the ashes, and its handle *p*, having a wedge beneath it, between it and the tin plate, to give the latter an inclination upwards, it is secured by a screw, and tin clasps passing from the plate to the sieve: *q* is an iron stem forked at bottom, for spanning the bar of the ash chamber, for it to rest on, the other end screwed or drawn out to a nail point in order to drive it into the wooden handle.

We now take notice of an article or two of convenient use with this stove, and which will render a man very much independent of the attentions or neglects of servants. For instance, to get a little water hot for shaving or otherwise, the tin vessel, No. 4, is used; being filled with water, it is clapped to the side of the stove, and the wire on left hand of the stove embracing it, forces it strongly against the hottest, often red-hot, plate of the stove, and boils it presently. If more dispatch is wanted, a flat piece of wood, that is of deal board, *z*, is thrust into the tin vessel, which excludes an equal bulk of water, when it is presented

as before in a thinner stratum to the action of the fire. In this way, the vessel is not blacked at all or smoked, and being dried over the top of the stove is always found ready for use;—or a small black tin pot may be put into the stove itself, and the doors closed, when the hot boiling water is procured almost instantaneously. Fig. 5, is a tin vessel also to fix on the side of the stove, wide enough for boiling an egg or so, in the same way. We need not further dilate on the very extensive application of it in a culinary point of view, as these things will suggest themselves almost naturally to one who requires their use, as with the student of small means, or to the poor man of honest endeavours, and to whom economy may be imperative. The stout wire seen to pass horizontally through the top of the stove with a brass knob to it, will conveniently suspend a fowl or other matter requiring to be roasted.

For chemical or pharmaceutical purposes a hole in the side of the stove enables us to work a retort. A larger opening, as of 5 or 6 inches diameter in the closing plate at the top of the stove, enables us to use a sand or water bath. And placing over this same opening a metallic or earthen flat pan, we may conveniently carry on the process of solution, evaporation, desiccation, &c., or use a small Still or alembic, such as is employed for scented herbs. A crucible placed in the naked fire can be brought to an intense heat. In some of these processes, as that of evaporation, distillation, &c., the grate, which is easily removable, must be advanced nearer the vessels by suspension or by transverse wires or rods across the supra-focal chamber. Also from the iron lid covering this opening, when not used as above, having a knob near the centre, with a hook below the plate, can be suspended any subject within the stove at any distance from the fire by an iron wire or link.

On facility in lighting a fire.

In cities and towns where wood is dear, the mode of lighting a fire is some consideration in the year's expenses: some servants very wastefully employing it, and others doing the same business as well with a very little; my way of doing it, which may, perhaps, easily be surpassed by the ingenuity and frequent practice of others,—and if not, my motto simply is, that of Horace, "*Si quid noristi, &c., his utere mecum*,"—I thrust a piece of paper downwards and through the bars, (having first cleared a couple of bars from fuel, so as to admit air freely through them, and thrown a few small bits of fresh coal upon them to get a flame from, these bits being surrounded with the rest of the least burnt cinders,) this paper being readily seen and lighted with a match or candle when wanted: I then place two or three pieces of paper again over the former piece, and over this lay a small handful of little twigs, of old basket, or of the usual deals reduced to thinness, and again on these lay a stouter piece or two to maintain the fire, and on these some coals piled round about, dust and nubbings mixed. I then set a light to the bit of paper under the grate, close the supra-focal door, and wait the event. If more expedition is wanted, close also, or nearly close, the focal door, which makes a rapid draught, and the unclosed door fans back the flame in a remarkable manner upon the fuel, and the ignition is then most rapid.

A CONJECTURE

RESPECTING THE SOURCE AND ORIGIN OF THE WORD "LONDON."

VERY diversified and numerous have been the conjectures of authors, respecting the name of this great City,—perhaps the largest, and most wealthy, and important in the world.

Reading the other day, Maitland's History of London, and what is there said of the *Downgate*, and which, he tells us was at a former period termed the *Downgate*, and of which I can entertain no doubt of its truth, but on which he makes no comment; we were immediately very forcibly struck, that the term duly considered, would afford us a very natural and simple clue to the name now used for this great metropolis, and which is of British origin, and derived very naturally, from the slope of ground which the northern bank of the River Thames is everywhere presenting to the north bank of the river, and this throughout the whole extent of the City from Tower Hill,—Fish Street Hill and Cornhill, being as it were, the principal summit of it,—and which advancing elevation of ground is seen extending itself northward, till it reaches the hills of Hampstead and Highgate, and must have formed, in a state of nature and unbuilt upon, a verdant slope of great beauty and extent; the same slope prevailing through all the Strand, to the Hay-market and Constitution Hill, a pleasing object, and at last declining into a noble river, carrying with it and suggesting to the natives the very natural appellation of the *Long Down*, the Romans who trafficked here following the same name, or *Longum Dunum*, or *Dunium*, and the Romans most naturally would apply the same to it, as a natural result, and who had thus probably received it from the British natives; also at times, these Romans called these sloping hills by the term *Taunus*; as in the hills above or beyond Frankfort-on-the-Maine, long occupied as a favorite military post by the Roman armies; the T in this word, is, as is indeed usual among the Germans, pronounced as a D, and hence we get, perhaps, the *Daunus*, and the *Daunians*, or inhabitants or soldiers of the *Taunus* or *Downs*, given in Latin as *Dunium*; then, we apprehend, came very naturally the *Longum Dunium*, or *Long Down*, applied to this site, and this, by the natural course of familiar use, became contracted into a single word—the *Longdown*, and which, for greater ease and euphony, became easily contracted again by the omission of the *g*, into *London*, by a process the most easy and natural, and hence in the refined language of Tacitus, the first after Cæsar, who had occasion in his History to use the word or appellation, at least that we at present know of, makes it *Londinium*, leaving out the *g*, as being merely superfluous, and standing in the way of a concise and elegant term—*Londinium*, in which there is nothing in the least forced or unnatural,—or *Londinium*, the vowel *i* being added in the middle of the word, for greater elegance and ease of expression.

This well-known term or appellation being laid down, as it were a base line, let us now see if there are any collateral proofs of this being its true etymology.

This same favorite expression of *Dunium* or Downs, also takes place at Sandwich, where the sloping ground advancing and depressing as it went towards the sea shore, and was continued, probably, a very long way under the waves,—caused not only the land so disposed to be called the Downs, but the very water itself, as lying on the slope, was hence called the Downs also, and is in familiar use at this day.

Now the all-conquering Romans, adopting the name naturally accruing from the natives, only changed it in the very slight manner we have just described, to suit better with their more elegant language, and perhaps at a time when commerce was but small, and a few scattered houses and wharfs only occupied the site, and when it was very natural to suppose some more sheltered or extended nook into the shore, gave it a preference for the landing of the vessels, and the transacting a commercial business with the natives, and this point would very naturally obtain the name which it holds to this day of Downgate or Dowgate. Its situation, near the middle of the shore of Old London, fully justifies such a supposition, and it evidently, by removing a few interposed obstructive buildings, obviously detached from the adjoining buildings on each side, would now become a large and noble port, such as might have sufficed in those early times, for the commerce of the town, the opening being longer than any near it on this side the river.

This same Port or Gate of Commercial intercourse with the Shipping, was enclosed, probably, to form the harbour for landing, and very naturally to it was added, as a great convenience, the *Trajectus* or *Ferry*, which appears to have gone across the river at this point, conferring with the opposite bank, or Southwark, there being no bridge at this period, and till the monks built one, viz. The London Bridge, these men being the best instructed in those early days in the arts of architecture. In process of time, London Bridge being built, its presentation and convenience, it is probable, would remove much of the use and advantage of this ancient ferry, as being long insufficient to a great and rapidly rising city, and it was done away.

It is also to be observed that near to this ancient port or landing place, is found the remarkable square piece of Stone, called the *London Stone*, fixed now in an adjoining Church Wall, and that would confirm this spot or neighbourhood, as of a marked preference and importance, and a way seems to be extending from it to the beautiful structure of Bow Church, one of the most elegant buildings in London, and one of Sir Christopher Wren's master-pieces, and standing, as we learn from its builders, on the foundation of a splendid Roman Temple; and here we are given to understand, was placed the *Milliarium*, or point of reckoning from the Metropolis to all parts of the Kingdom, and here commenced the Roman Itinerary and the great *Watling Street*, and which was so called probably on account of the marshy ground occupying this and a

large share of the city, as far as Moorfields, or far beyond, and which at this point to render it hard for convenient travelling upon, the road was deeply laid upon a thick stratum of wattles, as they are called, to our knowledge, in Oxfordshire, and many parts of this land to this day, "To wattle a boy," formerly a familiar expression, is to thrash him well with a flexible stick, and of this sort of osiers and other sticks, was laid the foundation of the way, admitting the wet to a free course and escape between them, which a more solid medium would not have permitted.

From this point also, it is probable might have proceeded the *Ichnil street or road*, and perhaps the *Herman Street*, also diverging from it; and this London Stone, was brought in Saxon times apparently to satisfy Scotland, as being their most ancient stone, used for their Coronations and was thus placed in this important point of the great City. The word *Herman* in German, equivalent to Gentleman, seemed to imply that this road was exclusively used for the higher orders, and for Government officials only.

Maitland also, was not suspicious or aware at least of the vast importance of this port, or point of the river. In calling it Down Gate it was so-called, he supposed, on account of *its going down* to the river as Stowe had described it before, not reflecting that the builders can soon make any ground level and fit for building on.

There appears also a further remark to make, and the evidence of a striking kind, and which relates to the important point or governing point of this kingdom's affairs, the famous *Downing-street*, in Westminster, such part being the conclusion or termination of this slope of the Down, in that direction, and which on that account, obtained very naturally the name of Down ending Street, which by a natural and convenient elision became contracted to *Downing-street*, and truly ominous has the word been, by the enormous debts contracted by the Councils held on this piece of ground, the Down extending through the Strand, and falling off at this place, into a comparatively level ground, holding the St. James's Park, and its beautiful water lake, and as Teddington also once was called, of which there is no doubt, the *tide-ending Town*.

We also have as a continuation of the same appellation, the Downings Wharf, in Lower or East Smithfield, being the other extremity apparently of this important descent called the Down. And at the Downing Street end, the Thames appears to have made an irruption into the land, and by a big wet ditch formerly running round the Abbey, at a considerable distance from it, circumscribing and insulating a large plot of ground on which was built this noble edifice. This ditch was named *The Long ditch*, and this insulated piece of ground so circumscribed, being a large patch of boggy ground growing abundance, as it appeared, of *Thorns* or thorn bushes occasioned it to be agreeably called the *Thorney Island*.

BRACY CLARK,

Giltspur Street, London. 1816.

I find since that the above history of the London Stone, belongs properly to the Stone in Westminster Abbey used in Coronations, and was brought to England by Edward the first, from Scotland. The London Stone is Larger, and of much greater antiquity, and may possibly have been the Stone used by the Romans for notification of the commencement of their *Milivarium*





